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Addressing the Environmental Aspects of Trade and Infrastructure Expansion

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MAPS

Acronyms and Abbreviations

AMAC	Association of Community Environmental Monitoring
ANAM	National Association of Municipalities
ARI	Acute respiratory infection
CACIF	Committee of Agricultural, Commercial, Industrial and Financial Associations (*Comité Coordinador de Asociaciones Agrícolas, Comerciales, Industriales y Financieras*)
CAS	Country Assistance Strategy
CEA	Country Environmental Analysis
CEPA	Canadian Environmental Protection Act
CCAD	Central American Commission for Environment and Development
CIG	Guatemala Chamber of Industry
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
COGUANOR	Guatemalan Standards Commission (*Comisión Guatemalteca de Normas*)
COCODES	Community Urban and Rural Development Councils
CECON	Center for Conservationist Studies
CONAMA	National Environmental Commission (*Comisión Nacional de Medio Ambiente*)
CONAP	National Council of Protected Areas
COPD	Chronic obstructive pulmonary disease
COMUDES	Municipal Urban and Rural Development Councils
DANIDA	Danish International Development Agency
DIRPONA	Division for Protection of Nature (of the National Civil Police)
DIGARN	Division of Environmental Management and Natural Resources of MARN
DPL	Development Policy Loan
DR-CAFTA	Dominican Republic-Central America Free Trade Agreement
EIA	Environmental Impact Assessment
EHS	Environment, Health & Safety (IFC guidelines)
FDI	Foreign Direct Investment
FOGUAMA	Guatemalan Fund for the Environment
GDP	Gross Domestic Product
GEF	Global Environment Facility
FLACSO	Facultad Latinoamericana de Ciencias Sociales
FSC	Community Solidarity Fund
IDAEH	National Institute of Anthropology
IADB	Inter-American Development Bank
IARNA	Environment and Natural Resource Institute at Rafael Landivar University
IUCN	The World Conservation Union (or *UICN* in Spanish)
IDEADS	Institute of Environmental Law and Sustainable Development
INAB	National Institute of Forests
INE	National Institute of Statistics

INFOM	National Institute of Municipal Promotion
INGUAT	Guatemalan Tourism Institute
ISO	International Standards Organization
LMA	Maximum acceptable limit
MAGA	Ministry of Agriculture and Livestock
MARN	Ministry of Environment and Natural Resources
MCIV	Ministry of Communications, Infrastructure and Housing
MDG	Millenium Development Goals
MEM	Ministry of Energy and Mines
MERCOSUR	South American Common Market
MINFIN	Ministry of Finance
MSPAS	Ministerio de Salud Pública y Asistencia Social
MYPINE	Small and Medium Enterprises
NAFTA	North American Free Trade Agreement
SEA	Strategic Environmental Assessment
SCEP	Executive Secretariat of the Presidency ("*Secretaría de Coordinación Ejecutiva de la Presidencia*")
SEGEPLAN	Planning and Programming Secretariat of the Presidency
SEMARNAT	Environment and Natural Resources Secretariat of Mexico
SIA	Environmental Information System
SIG	Geo-referenced Information System
SIGAP	Sistema Guatemalteco de Áreas Protegidas
SIGSA	Health Management Information System
SPS	Sanitary and Phytosanitary measures
TSP	Total suspended particles
UNIPESCA	Fisheries Unit of MAGA
UPGGR	Geographic Planning and Risk Management Unit of MAGA
USDA	United States Department of Agriculture
UNEP	United Nations Development Programme
WTO	World Trade Organization

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Executive Summary

1. Introduction

Guatemala's difficult colonial past and a debilitating 36-year civil war left a legacy of extensive poverty and inequality, poor social indicators, and deep social, ethnic, and political divisions. Since signing of the Peace Accords in 1996, Guatemala has made substantial progress in consolidating peace and democracy. While progress in socioeconomic development has been uneven, there have been important gains in education and health coverage, sustained increases in social sector spending, improved coverage of basic utility services, and better management of public finances, among other gains. Unfortunately, progress has been slower than expected in several important areas, including economic growth rates.

As in other post-conflict situations (e.g., El Salvador and Nicaragua), peace created opportunities for environmental protection. In order to strengthen institutional capacity to address environmental problems, the Ministry of Environment and Natural Resources (MARN) began its operation in 2001 and the regulatory framework was significantly expanded.[1] Despite these institutional efforts, Guatemala still faces considerable environmental challenges:

- *Over-exploitation of water resources.* Municipalities adjacent to Guatemala City have a 2.5 cubic meter per second water deficit, and between 1970 and 2001 there has been, on average, a 20-25 percent reduction in water flow in the country's rivers.[2]
- *Water pollution.* On average, five children die every day from water-borne diseases. The annual health cost of these diseases — caused by poor quality water, sanitation, and hygiene — is 1.6 percent of GDP.
- *Air pollution (indoor and outdoor).* Acute respiratory infections (ARI) were the leading cause of death and illness in Guatemala between 1970 and 2000. The annual health cost of air pollution is 1.2 percent of GDP (0.95 percent indoor air pollution and 0.25 percent outdoor air pollution).
- *Environmental health in rural areas.* Health-related pollution problems are especially acute in rural areas (home to about 60 percent of the population, where three-quarters fall below the poverty line, and one-quarter live in extreme poverty). The annual cost of water-borne diseases caused by poor quality water, sanitation, and hygiene in rural areas is 0.97 percent of GDP; and the annual cost of indoor air pollution-related illnesses in rural areas is 0.7 percent of GDP.

1. There were 69 environmental regulations (normas) before 1990. Almost 1,000 regulations were passed between 1991 and 2000, the great majority in the second half of the decade.
2. UNEP. GEO Centroamerica Perspectivas del Medio Ambiente 2004.

- *Deforestation.* The annual rate of deforestation is 1.7 percent (more than three times the average rate in Latin America and the Caribbean).[3]
- *Soil and land degradation.* About 10 percent of land is highly degraded and 63 percent could become highly degraded in the near future. The annual cost of soil and land degradation amounts to 0.55 percent of GDP.
- *Vulnerability to natural disasters.* Because of its geographic location, Guatemala is highly vulnerable to natural disasters such as droughts, floods, volcanic eruptions, and earthquakes. This environmental vulnerability is greatest in the upper parts of the three main watersheds, which are also the most densely populated. These areas have shrinking natural forests, high rainfall, and steep topography, characteristics that increase the vulnerability of people in the middle and lower parts of the water basins, which suffer the greatest damage from natural events that can easily become disasters. The average annual cost of natural disasters is 0.57 percent of GDP.

These problems pose a considerable socioeconomic cost — 2.86 percent of GDP annually when only the health costs of a degraded environment are considered. Costs are especially high among vulnerable groups such as indigenous people and poor children. At the same time, the country needs to improve competitiveness and promote investment to reduce poverty through much needed economic growth[4] and improve human conditions. Many economic policy decisions in the near term may have long-term environmental consequences, but perhaps more importantly, some choices will be irreversible or can be reversed only with great difficulty.

Some of the most difficult issues may involve trade-offs between preserving natural systems and pressing forward with economic growth (developing oil and gas fields, and expanding the road network and agricultural frontier). These will pose difficult challenges for Guatemalan environmental institutions, which must be able to address those challenges by finding and taking advantage of all the win-win opportunities — avoid unrealistic regulations that might hinder competitiveness and damage the environment (because they are not credible or enforceable), carefully evaluate unavoidable trade-offs, and make and enforce decisions that benefit current and future generations. This is especially relevant because adoption of the Dominican Republic-Central America Free Trade Agreement (DR-CAFTA) is expected to accelerate economic growth and expand infrastructure, which in turn should promote investment and expand exports.

Based on the best regional and international practices, this report concludes that mainstreaming environmental considerations into sectoral policies rather than scaling-up the operations of environmental agencies is the best way to prepare Guatemalan institutions for current environmental challenges and those it will encounter in the future. The report also emphasizes the need to provide the right incentives to economic agents

3. UNEP 2003.
4. The Bank's Country Economic Memorandum indicates that the economy needs to grow at about 5 percent (2.4 percent per capita) annually to achieve MDG targets.

(e.g., promoting compliance through achievable requirements but with credible sanctions to violators, rather than trying to change behavior by threatening with criminal charges that are ultimately not enforced) and to engage civil society by improving information and participation mechanisms.

2. Institutional and Organizational Analysis

This report explores not only the current basic institutional framework (policies, laws, regulations, instruments) but also the organizational and human capacities to enforce them in an effective, efficient, transparent, and accountable way. The synthesis of these two dimensions is used to identify key strengths and weaknesses in the Guatemalan institutional and organizational framework.

Guatemala has made significant progress in establishing a solid legal and institutional infrastructure for environmental protection. This framework provides a sound — but still incomplete — basis for developing effective environmental policies. The country amended the Constitution to give legal importance to environmental issues (1985); passed an environmental law and created the National Environmental Commission[5] (1986); passed a law on protected areas and established the National Council of Protected Areas[6] (1989); created the Environmental Secretariat[7] (2000); created the Ministry for the Environment and Natural Resources (2001); and launched an environmental agenda (Guateverde 2004-2008) aimed at ensuring the long-term sustainability of the country's development program through systematic attention to environmental considerations.

Given the new challenges facing the country with the signing of DR-CAFTA and the proposed scaling-up of infrastructure investments, there is a need to accelerate consolidation of institutional and organizational tasks in Guatemala. This report concludes that meeting these challenges requires MARN to concentrate on key tasks; identifies a significant potential for short-term institutional adjustments and improvements that require only further implementation of the current LMA; and pinpoints crucial legal changes that require longer periods of negotiation and consensus building across multiple stakeholders.

In terms of the institutional framework, Guatemala needs:

- *A clear statement of policy priorities and goals.* Environmental policies lack sufficient clarity for implementation.
- *Stronger capacity for coordination.* Mainstream environmental considerations into sectoral policies of the executive power and coordinate environmental policy interventions with municipalities.
- *More detailed technical regulations.* These are especially needed for discharges to air, soil, and water.

5. Ley de Protección y Mejoramiento del Medio Ambiente and Comisión Nacional de Medio Ambiente (CONAMA).
6. Ley de Areas Protegidas and Consejo Nacional de Areas Protegidas (CONAP).
7. Secretaría de Estado de Medio Ambiente.

- *A more efficient and effective licensing process.* Add new environmental management instruments and delegate functions to municipalities and environmental units of other ministries.
- *Increase emphasis on compliance.* Ensure that regulations are applicable and decriminalize the approach to compliance and enforcement (laws and regulations rely almost exclusively on command-and-control measures to address non-compliance rather than providing a complete set of more flexible mechanisms to foster compliance, complemented by coercive measures).
- *Increase involvement of citizens and civil society in environmental issues.* Strengthen social accountability mechanisms by enhancing the capacity of ordinary citizens to obtain information, voice their needs, and demand accountability.

Perhaps the main challenge for environmental management in Guatemala is to improve the institutional framework of organizations (especially MARN). Guatemala can learn from international experience and steer MARN toward performing and concentrating on key functions for sustainable development rather than diluting its efforts with too many activities. Key functions include:

- Pick up signals about needs and problems, particularly from the fringes. Generate information, use it to establish policy priorities, give citizens a voice, and respond to feedback. There is evidence that Guatemalan environmental organizations are not effectively identifying and addressing some of the highest-priority environmental issues such as serious environmental health problems caused by air *and water pollution.*
- Balance interests by forging agreements with other sectoral authorities (to mainstream environmental considerations) and by providing rules and incentives that will guide behavior on environmental issues. The study found that there is plenty of room to improve the mainstreaming of environmental considerations into sectoral policies.
- *Execute* and implement sectoral and inter-sectoral agreements by following through and promoting compliance and enforcement to lend credibility to environmental policies and avoid commercial disputes (especially in light of DR-CAFTA).

3. Managing the Environmental Implications of DR-CAFTA

3.1 Trade and the Environment in Guatemala

In the recent past Guatemala has made significant progress in its degree of trade liberalization, promotion and diversification of exports, and conduct of international trade negotiations. There have also been important advances with the signing of DR-CAFTA and application of rules established by the WTO. Total exports of goods increased at an annual rate of around 10 percent in the last decade, reaching a value of US$ 3,430 million in 2004, while imports increased at a rate of 4.5 percent to US$ 7,812 million in 2004. In

addition to traditional exports such as coffee, bananas, sugar and cardamom, Guatemala also witnessed particularly dynamic non-traditional exports to the rest of the world, including Central America. There were considerable import increases recorded in consumer goods, capital goods, raw materials, and fuel and lubricants.

Ratification of DR-CAFTA with the United States will help Guatemala secure broad and stable market access to its main trading partner and provide an anchor to implement growth-oriented institutional reforms. Such reforms should help attract new private investment and strengthen the traded goods sector as Guatemala faces growing international competition, including from the recent expiration of quotas on world trade in textiles. At the same time, the increasing importance of international trade poses challenges in the context of the international economy, characterized by global and competitive markets, which also demand a sophisticated technical capacity to administer complex trade discipline. In order to cope with these challenges, Guatemala needs to strengthen the institutions that manage international trade.

One aspect of trade liberalization is the call to improve environmental standards, not only to protect natural assets and public health, but also to assure foreign importers and investors concerned about corporate responsibility, and to gain access to international markets, particularly for future development of the industrial and agricultural sectors. In the discussions about DR-CAFTA's effect, much emphasis has been placed on the importance of the environment and natural resources

3.2 Trading Patterns and Implications for the Environment

While the share of traditional exports and their economic importance has been declining, the sector still makes a considerable contribution to employment and value-added products. The share of the non-traditional sector, on the other hand, has increased significantly, rising from 62 percent of total exports in 1999 to 71 percent in 2004. The *maquila* industry especially has become a major contributor to exports and foreign exchange earnings. This is mainly due to expansion of the industries operating under special regimes such as free zones, and to outward processing warehouses.

We find a steady increase in the volume of exports since 2000 (except for a small dip in 2002), although there has not been an overt trend toward expansion. Two sectors where this trend is slightly more pronounced are food processing (food and live animals) and chemicals and manufacturing. Food and food processing operations dwarf all other exports in Guatemala and are responsible for producing considerable waste in a variety of forms such as wastewater, solid waste, and air emissions. In the absence of adequate controls, these could become a serious threat to human health and the environment. Currently there is a paucity of environmental instruments to deal with existing environmental challenges in the country. Much of the focus is on use of environmental assessments rather than on any incentive-based market instrument. Similarly, an over-emphasis on the criminal justice system to deal with environmental infractions often thwarts adoption of innovative mechanisms to deal with environmental requirements. In the absence of a regulatory and enforcement framework, the expanding manufacturing base could further accelerate existing environmental problems. According to a recent

World Bank study, many of the benefits from DR-CAFTA are in fact expected to translate into significant expansion of tobacco and non-traditional *maquila* sectors.

Guatemala continues to be a major importer of heavy machinery and equipment, chemicals, and manufactured goods, which reflects an increasing transformation from a traditional economy to a modern process-oriented economy. The environmental price of this could be high if it also involves import of cheaper pollution-intensive technologies, including excessive reliance on imports of second-hand vehicles.

3.3 Technical Barriers

The efforts to expand Guatemala's trade in both traditional and non-traditional areas could face serious challenges from the very stringent and always changing international environmental requirements (including food safety and health requirements, often referred to as Sanitary and Phytosanitary measures [SPS]). Compliance with these requirements is an important prerequisite for Guatemala's export competitiveness. Even though environmental requirements (to meet developed-country standards) are often viewed as a hurdle to a developing country, compliance can be an opportunity not only because it would ensure that more exports enter the world market, but there is evidence to suggest that compliance with international requirements helps to accelerate the pace of improvements in food safety, occupational safety and health, and air and water standards at the national level.

DR-CAFTA also includes an understanding that implementation of existing obligations under the WTO Agreement on the Application of Sanitary and Phytosanitary Measures will be a shared objective of the countries. The biggest challenge facing Guatemala, however, is lack of capacity both in the public and private sectors to comply with requirements and to undertake the necessary monitoring to ensure that compliance has been achieved. Among the Central American countries, Guatemala has had the highest average refusal rate for violations of U.S. standards under the Food, Drug, and Cosmetic Act.

Small-scale producers for whom DR-CAFTA is intended to provide maximum benefits are particularly handicapped by their inability to meet increasingly stringent international requirements. This problem was confirmed by a recent USDA study that also identified lack of proper guidance and insufficient technical expertise as a major constraint for complying with SPS requirements. This is further exacerbated by lack of awareness, little coordination among the relevant institutions, and little or no participation in the process of setting standards and requirements for key exports.

3.4 Foreign Direct Investment

Foreign direct investment (FDI) has been steadily increasing in Guatemala, although it remains much lower than in other countries in the region. The inward stock of FDI has increased from about US$ 2 billion in the early 1990s to about US$ 4.5 billion in 2005. Much of the initial FDI in Guatemala was concentrated largely in the manufacturing, petroleum, and finance sectors due to gradual liberalization of foreign investment laws.

More recently, however, the rapid growth of the *maquila* sector could be attributed to success of the free trade zones in attracting FDI.

DR-CAFTA is also expected to encourage investment, including FDI flowing to Guatemala, although the magnitude of such flows and their implications for the environment are difficult to anticipate. Investors are likely to be attracted by the new profit opportunities brought about by DR-CAFTA, and more significantly by the credibility (or reduced risk) that DR-CAFTA is likely to introduce. However, a recent World Bank "investment climate" survey identified a number of challenges such as trade and customs regulations, tax administration, and business licensing as continuing major impediments to attracting foreign investment.

Although not specifically mentioned, a number of multinational investors are also concerned about environmental regulations, not so much their stringency, but incomplete or inconsistent regulations that create uncertainties with their (global) environmental responsibilities and unequal enforcement that prevents a level playing field. Transparent and consistent regulatory structures for environmental protection are therefore seen as a precondition for making informed investment decisions and for attracting reputable, strategic investors.

From a corporate point of view, there are several benefits to adopting cleaner environmental techniques and conditions. Better environmental performance is often seen not only as synonymous with improved quality of final products, but also improved operating efficiency with use of fewer resources and less waste, all of which increase profitability. As a part of improving its overall business environment, the government of Guatemala could use this opportunity to create the right incentives to conduct operations in an environmentally sound manner.

Recent efforts by the Government to encourage foreign investment in the sub-surface mineral and petroleum sector are welcome. While growth in the sector is needed to generate much-needed foreign exchange and government revenue and contribute to the country's economic development, weak planning and regulatory capacity can undermine sustainable development by increasing environmental risks and costs, aggravate existing poverty, and deprive future generations of the option to sustainably utilize the mineral resource. The minerals sector also has significant adverse impacts on the environment, health, and livelihood of mine workers and adjoining communities, a majority of whom are very poor.

Restructuring the minerals sector, currently underway by the government, provides a unique and timely opportunity to enhance environmental and social performance of the minerals sector. There is a need, however, to ensure that there is a supporting policy and regulatory framework that encourages an environmentally sustainable and socially responsible minerals sector.

3.5 Implications for Agricultural Frontier Expansion

Guatemala could significantly increase its agricultural exports to the U.S. as some of the barriers are eliminated under DR-CAFTA. According to a recent Bank study, there are opportunities for large increases in farm income in high-value coffee, horticulture, and livestock. A significant component of Guatemala's strategy to take advantage of the benefits of DR-CAFTA should therefore be to design a strategy to increase production and export opportunities in agriculture and agro-industrial products.

Agricultural growth will, however, be constrained by unequal access to land, degradation of natural resources such as water and soil fertility, absence of technologies to enhance productivity, weak local institutions, and access to markets. Guatemala also has one of highest rates of deforestation in the region and in the world (1.7 percent[8]) and highest population growth rate (2.6 percent). In the past much agricultural expansion has been at the expense of frontier migration by subsistence farmers who clear forested land for cultivation. The combination of population pressure and in-migration has seriously affected frontier deforestation in Guatemala, increased poverty, and degraded the environment.

Studies suggest that negative effects of DR-CAFTA could be concentrated in the segment of rural households that are poor and most vulnerable. There is thus a danger that increased pressure on this segment of the population could further push them to the frontiers in search of better economic opportunities. This has serious repercussions for the rapidly degrading forest areas — especially Peten — where the most vulnerable live and will be negatively affected.

It is therefore pertinent that any strategy to promote agro-exports should be accompanied by significant attention to smallholder farmers, especially given their high levels of poverty and vulnerability. Any policy to promote agriculture should be designed to intensify production on small holdings through enhanced soil fertility, irrigation, high yielding varieties, etc. Further, property rights, land titling, and land tenure all need attention. Land tenure should not only ensure secure tenure, but also promote intensified land use and reduced pressure on forests.

4. Managing the Environmental Implications of Infrastructure Expansion

Guatemala's historically poor infrastructure has been a major limit to growth. Furthermore, this growth bottleneck could become more severe as the country opens up to greater foreign competition with the implementation of DR-CAFTA. A recent World Bank document[9] identified infrastructure development as the second most important economic growth determinant (following education). In addition, rural poverty is generally related to insufficient access to productive assets and rural infrastructure, notably road networks. Roads are important to reduce rural poverty and build social cohesion by improving and maintaining access in rural areas to markets, schools, health

8. World Bank. The Little Green Data Book; 2005.
9. World Bank (2004) Country Economic Memorandum.

centers, and other social and economic infrastructure. Accordingly, the expansion of public investment is mentioned as a key component in the second pillar of the Government's Development Plan.

The transport sector has become the main focus of Central Government spending on public infrastructure.[10] Following public sector reforms of the 1990s, most of Guatemala's infrastructure spending in the energy and telecommunications sectors is now carried out by the private sector, while public sector involvement is largely limited to regulatory functions and expanding rural access. Additionally, public infrastructure spending in the water and sewer sector is mainly the responsibility of municipal governments. In the transport sector, however, the Central Government has retained a lead role.

The Government's strategy and objectives for the transport sector are laid out in two documents: *Lineamientos Generales de Gobierno, Período 2004-2008* and the *Programa de Reactivación Económica y Social 2004/2005* – known as the *¡Vámos Guatemala!* Program. With the advent of DR-CAFTA, the government's transport strategy is aimed at providing adequate support to productive activities by consolidating building and maintenance programs for the road network. Two major projects are planned: (i) the 103.5-kilometer Metropolitan Beltway that is expected to benefit over 23 percent of the population (about 3 million people) living in the Departments of Guatemala and Sacatepequez; and (ii) the Northern Inter-oceanic Highway with an approximate 362-kilometer extension running from East to West. These works will include housing, industrial, and commercial projects and the corresponding water and sanitation infrastructure.

Another sub-sector in the government's transport agenda is ports. Port infrastructure in Guatemala is considered very inefficient by users. Most cargo traffic is concentrated at three ports. Two are administered by the public sector — Santo Tomas de Castilla on the Atlantic and Puerto Quetzal on the Pacific — and one under private administration, Puerto Barrios on the Atlantic. Logistics (i.e., stockholding, transport, distribution) and related infrastructure services have become an essential element in companies' location decisions due to the reorganization of production and distribution chains brought about by globalization and regional integration. Containerization is an important issue and major investments in cargo handling infrastructure in all three ports are expected. The required infrastructure expansion will challenge the policy instruments currently used to manage corresponding environmental impacts.

The primary instrument for managing the environmental implications of infrastructure investments in Guatemala is the Environmental Impact Assessment (EIA). EIA is a relatively new process in Guatemala and has been legally regulated only since 2003. As in many other countries in Latin America, EIA in Guatemala is a process driven by the need for environmental approval and licensing. According to the Regulation for

10. In 2005 the MCIV executed an investment budget of about US$ 320 million of which about US$ 260 million were assigned to the transport sector, and of those, approximately US$ 230 for roads.

Environmental Evaluation, Control and Follow-up 23-2003, all commercial and industrial projects need an environmental license. Nearly 2,000 EIA applications are submitted annually, a number that is beyond the capacity of MARN to review and consider.[11]

Despite impressive efficiency gains,[12] EIA is overburdened and unable to manage the environmental implications of the country's current projects, let alone an ambitious increase in infrastructure-related projects. The solution to this problem will require not only efficiency from improved processes, equipment, and training,[13] but it must include a new approach to environmental management. Two key characteristics of the new approach should be: (i) delegation of some of MARN's functions — including licensing minor projects — to municipalities and environmental units of "high consumers" of permits like MCIV (under the guidance and supervision of MARN); and (ii) using additional policy instruments.

EIA became the main (and sometimes only) policy instrument to minimize or mitigate environmental impacts to third parties due to the absence of other instruments such as regulations for pollution control, zoning, and water management. Only by designing and implementing additional environmental policy instruments will Guatemala be able to attain efficient, effective, and affordable environmental management.

The new regulations should include environmental standards for the design, construction, operation, and maintenance of infrastructure. By adapting these standards, localized, direct impacts would be managed through the engineering process and be subjected to normal enforcement mechanisms rather than the EIA process. The EIA would, nonetheless, still play an important role in regulating infrastructure projects that may have significant effects according to a more selective screening process. The screening criteria may include, among others, protected areas, effects on vulnerable groups, and vulnerability to natural disasters.

The planning capacity of MCIV (Ministry of Communications, Infrastructure and Housing) should also be strengthened. Although MCIV represents the chief policymaking and planning institution for the transport sector, it does not have the capacity to carry out necessary sector planning activities. Lack of qualified staff at the ministry's planning office renders it practically inoperative. To carry out specific analyses, MCIV generally looks for support from the planning offices of other entities subordinated to it. Although these other offices often have ample analytic capacity in certain areas, they do not count on a sufficiently broad sector vision to develop sector action plans in an integrated manner (including, among others, environmental considerations). This has resulted in the absence of an inter-modal vision and sector investment plan to guide the allocation of resources in the sector.

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11. Data provided for 2005 by MARN.
12. Due to an inclusion list (*lista taxativa*) that describes four categories of projects (according to their potential environmental impact or risk) and their corresponding EIA types.
13. This report includes recommendations in these areas.

5. Conclusions and Recommendations

Guatemala, a small country rich in natural resources, needs to improve its competitiveness and promote investment to generate much needed economic growth to reduce poverty and improve human welfare. To do so, however, the government needs to provide the best affordable environmental management to secure sustainable economic development. The benefits of further improvements to environmental institutional and regulatory frameworks will be substantial not only to facilitate and sustain trade and infrastructure expansion, but also to preserve the natural resource base on which economic growth depends. Moreover, while DR-CAFTA is expected to bring new possibilities for investment and trade, the agreement will also raise scrutiny and monitoring of environmental compliance by Guatemala's trade partners. Maintaining low compliance rates would add unnecessary friction and raise the regulatory risks for investing in the country.

Meeting these challenges will not come from simply scaling-up MARN's current activities by increasing its budget and staff. Guatemala must learn from its experience and international best practices and adapt its institutions and organizations to local conditions and challenges. This study shows that further improvements to Guatemala's environmental management framework are required to achieve the following objectives:

- Define policy priorities and allocate resources accordingly.
- Improve coordination among the different government agencies with environmental responsibilities.
- Complement existing environmental management instruments (EIA) with, among other instruments, emission and discharge standards for pollutants and land zoning.
- Adjust environmental evaluation instruments, particularly EIA and SEA, to current development and environmental needs.
- Improve the monitoring and compliance framework according to national priorities and DR-CAFTA requirements.
- Integrate available environmental information and use it as a fundamental instrument for decision making, public participation, and accountability.
- Determine other medium- and long-term legal and regulatory gaps that need to be addressed to improve environmental conditions and set priorities in Guatemala.

The study suggests that if MARN concentrates on its core functions and works in coordination with other environmental agencies, ministries, and municipalities, most of these objectives can be achieved in a short time with minor adjustments to the existing framework of environmental management. In the long term, deeper reforms to the legal framework for water and transparency would be needed, but they need longer periods of maturation, consensus building, and negotiations, and ultimately congressional approval. Therefore, the study makes the following general recommendations.

5.1 Strengthen Environmental Quality by Integrating Environmental Considerations into Sectoral Policies; and Improve Effectiveness of MARN to Plan and Oversee Environmental Policies

5.1.1 Establish a Cohesive and Coordinated Environmental Framework

One of the greatest weaknesses identified in the environment sector is the lack of an environmental policy that orients the country toward specific goals and that clearly establishes short-, medium-, and long-term priorities. Although MARN has issued a policy on Environmental Conservation, Protection, and Improvement, it is not shared among all government agencies with environmental responsibilities. To ensure that a policy is developed that represents these different government agencies, both the Environmental Cabinet and the Consultative Council (see 5.2) within MARN should take primary responsibility for developing such a policy.

In the short-term, the policy should (i) establish what it aims to achieve in the next 18 months, with measurable results that focus on addressing environmental priorities; (ii) contain principles that can be converted into action by government institutions; and (iii) clearly define responsibilities among different institutions as well as resource allocations. So that the policy can achieve concrete results in the short term, it is recommended that (i) the preparation process be led at the highest government level through the Vice Presidency; (ii) there is a well-defined and time-bound plan for preparing the policy; and (iii) training is provided for those involved in the preparation process.

In addition, the following four elements could help integrate environmental considerations into national economic and development policies in the medium- to long-term and strengthen institutional capacity in priority areas.

- Prioritize environmental issues in terms of their effect on economic development and poverty reduction, using both quantitative and participatory techniques, in order to select themes or sectors for which there is a definite recognition of the severity of environmental problems.
- Identify mechanisms that bring together different viewpoints during the policy formulation and implementation process, particularly the viewpoints of the most vulnerable groups.
- Identify mechanisms that ensure social accountability in the context of environmental issues such as passage of legislation for greater transparency in decision making and outcomes.
- Identify mechanisms through which social learning can occur so that key environmental priorities are prominent and always included in the policy agenda so that incremental improvement can occur over time.

5.1.2 Coordinate Environmental Concerns across Sectors

To achieve the above four elements in 5.1.1, environmental issues cannot be addressed in isolation. Given that the environment cuts across economic sectors and several institutions with environmental functions, cross-sectoral coordination and an improved decision-making process is essential. Cross-sectoral coordination bodies can help align the operations of different agencies. This coordination must be institutionalized at the highest government level — the Cabinet. Political analysis of the Cabinet system in Guatemala has shown that coordinating bodies have been successful when (i) they oversee a well-defined policy, priorities, or activity; (ii) there is a strong political leader to champion a cause; and (iii) technical and financial resources are available for monitoring and oversight.

Box A. *Comisión Nacional del Medio Ambiente (CONAMA)* in Chile

Chile's National Commission for the Environment (Comisión Nacional del Medio Ambiente, CONAMA) offers a good example of coordination among ministries to further environmental objectives. CONAMA's Executive Director is appointed by the country's President. However, CONAMA´s highest authority is the Managing Council (Consejo Directivo), headed by the President's Chief of Staff (Ministro Secretario General de la Presidencia) and composed by the Ministers of Economy, Public Works, Agriculture, Health, Mining, Housing and Urban Affairs, Transport and Telecommunication, Planning, Education, and Foreign Affairs.

The council's main functions include: (i) coordinate government environmental policy and foster integration of environmental concerns in other policies; and (ii) coordinate enforcement actions between national agencies and municipalities.

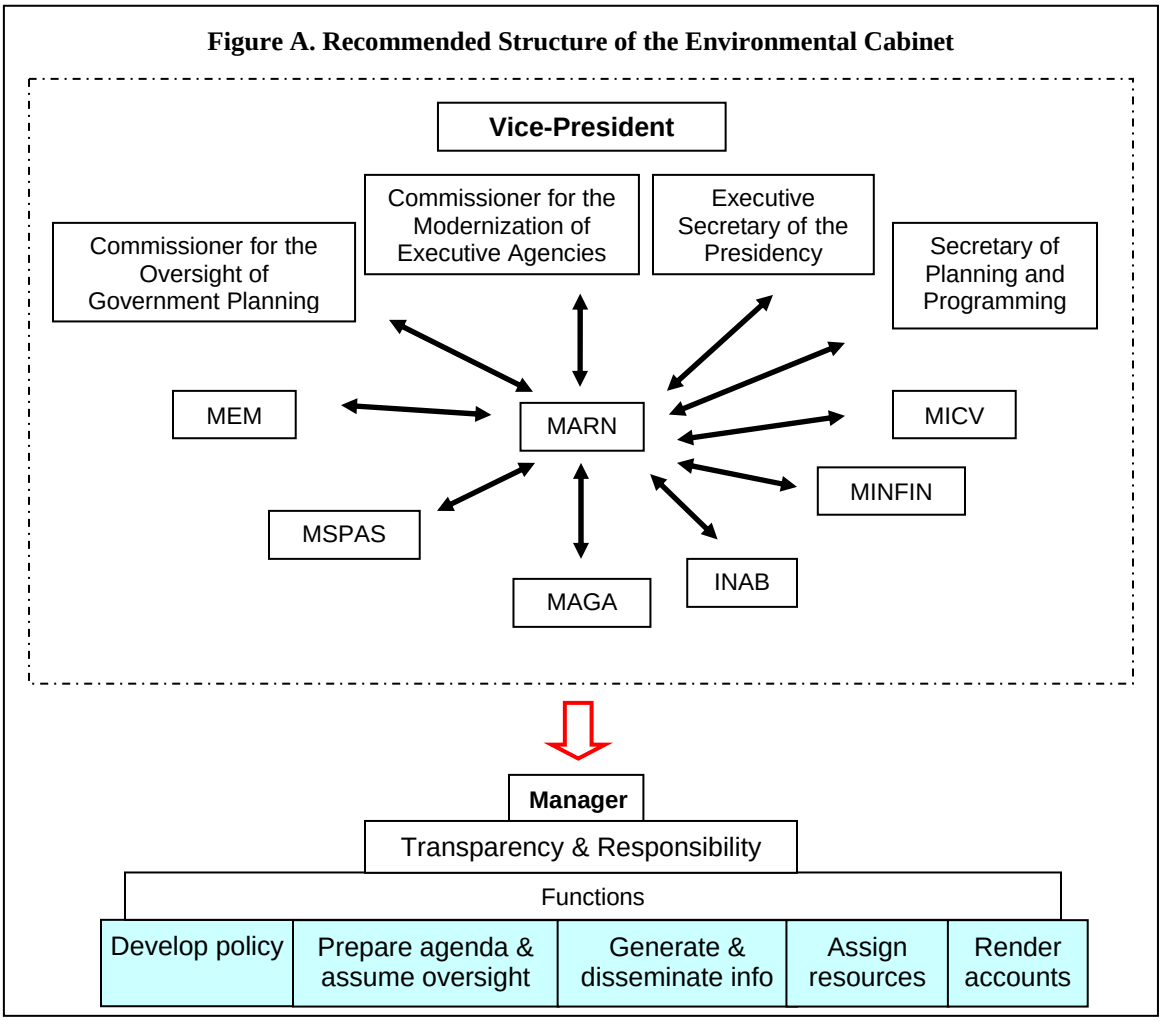
Due, among other things, to the coordination provided by CONAMA's Managing Council, Chile uses a wide range of instruments in connection with environmental policy: EIA, other regulatory instruments, economic instruments, voluntary agreements and planning and information instruments. The effective application of these instruments has allowed Chile to: (i) introduce a major and successful reform in water and sanitation service provision; (ii) increase significantly the amount of solid waste deposited in sanitary landfills; and (iii) reduce emissions of lead, and particulate matter, even as economic activity has expanded.

Although an Environmental Cabinet has been legally formed, it has not been convened by the Vice President to date. This Cabinet should be activated in order to improve cross-sectoral coordination among the different government agencies with environmental responsibilities and strengthen decision making. The report recommends that the Cabinet include (i) the Commissioner for the Oversight of Government Planning; (ii) the Commissioner for the Modernization of Executive Agencies; (iii) the Secretary of Planning and Programming; (iv) the Vice-Secretary of the Executive Secretariat of the Presidency; (v) the Minister of Environment and Natural Resources; (vi) the Minister of Public Health and Social Welfare; (vii) the Minister of Finance; (vii) the Minister of Agriculture; (viii) the Minister of Mines and Energy; (ix) the Minister of Communications and Housing; (x) the Manager of INAB; and (xi) the Executive Secretary of CONAP. Further, it is recommended that the Cabinet have the following responsibilities:

- Define short-term policies.

- Define an agenda and oversight mechanisms for the policies.
- Coordinate actions and facilitate the flow of information among the entities involved in policy implementation.
- Provide information and disseminate results to stakeholders, as well as to the public.
- Periodically evaluate progress on the implementation of policies with the support of data, results, and experience achieved through inter-sectoral coordination and learning.

Figure A. Recommended Structure of the Environmental Cabinet



Decree 68 of 1986 and Decree 90 of 2000 created the Ministry to establish environmental policies and norms. To date, MARN has centered its efforts on evaluating environmental assessments — where it concentrates 46 percent of its budget — but has shown less emphasis on planning a national environmental policy, coordinate environmental efforts with other line ministries, and monitor and enforce. As such, the report recommends that MARN prioritize its role in managing governance instruments such as environmental laws, regulations, and enforcement actions, in particular by setting minimum standards, regulating resource management, ensuring compliance with obligations, and

decentralizing its implementation responsibilities. The following sections 5.1.3, 5.1.4 and 5.1.5 provide specific recommendations.

5.1.3 Strengthen MARN's Role as a Sectoral Leader

Establish a Consultative Council to serve as an advisory board to the Ministry for policy and regulation. The Council should, at a minimum, have the following responsibilities:

- Provide recommendations on the formulation and design of sectoral policies and norms.
- Recommend actions that support compliance with the legal framework.
- Present initiatives that support the development of new norms.
- Promote programs on pollution prevention, environmental education, and information and dissemination.
- Act as an information source to support transparency and public participation (see 5.8).

The report also recommends that the Council include all stakeholders that hold environmental responsibilities, including representatives of the public and private sectors, and civil society. Given that the Council is an inclusive body representing vast interests and points of view, it should have (i) a clear work program; (ii) priorities that can be realized in the short term; and (iii) a coherent strategy that represents its multiple members. To ensure that the Council is effective, it should meet quarterly and provide periodic reports on its actions. Once the Council has been formed, it is recommended that MARN make a formal request to international organizations such as OAS and UNDP to obtain resources (both technical and financial) to support the Council's recommendations.

5.1.4 Decentralize and Delegate Responsibilities

MARN's delegations have multiple responsibilities but few resources to fulfill them, which in turn limits the coverage and capacity of the country's environmental management. As such, the report recommends developing a strategy to increase the efficiency and effectiveness of environmental management via decentralization of environmental functions. This strategy would begin with an initial phase of decentralizing the receipt and management of environmental assessment applications and information requests, and later be extended to include environmental oversight and analysis functions.

To implement this first phase, the report makes these recommendations:

- Review and/or prepare procedural manuals so that processing applications and information requests is conducted in a uniform and systematic manner.
- Establish agreements with government organizations that have departmental and municipal offices to support the decentralization process (i.e., support responding to application and information requests).
- Provide technical support to existing environmental units in MCIV, MEM, INFOM, municipalities, among others, so that environmental assessments

originating from these agencies' investments are more complete, facilitating MARN's analysis and oversight of these assessments.

- Promote creation of more environmental units in other ministries and private organizations and councils so that they can support preparation of environmental assessments and facilitate their analysis and oversight by MARN.
- Issue norms and technical standards to certify public and/or private laboratories, enabling the verification of compliance with mitigation plans. In cases where these certification agencies do not exist, they should be created.

5.1.5 Promote Coordination with Municipalities

Given that the Municipal Code establishes that many environmental responsibilities fall under the jurisdiction of municipalities that are autonomous government entities, it is essential that MARN collaborate with municipalities for the following reasons:

- To provide technical standards, technical assistance, and training that will improve municipal performance in carrying out their responsibilities.
- To promote the establishment or strengthening of municipal environmental units that (i) support the development of municipal projects, including those that support environmental protection; and (ii) can enforce and oversee the protection of natural resources and mitigation of environmental damages due to municipal activities.

In the short term, the report recommends that MARN establish support agreements with the most populated municipalities (those with a population over 100,000). It also recommends that MARN carefully examine initial efforts at INFOM, in which a unit has been established to support environmental mainstreaming in municipal projects that are presented to the agency for financing. The design of this unit could be used as a model to be replicated at the municipal level in the medium term.

The report also recommends that MARN establish a dialogue with municipalities through the National Association of Municipalities (ANAM) about competencies legally assigned to national and municipal authorities that might overlap (e.g., management and use of natural resources and management of solid waste). ANAM should also be included within the Consultative Council to ensure adequate coordination.

5.2 Address Regulatory Gaps

The country's Environmental Protection Law, Decree 68 of 1986, calls for a number of regulations to protect its natural resources, including air quality, water systems, audio and visual pollution, endangered species, national heritage, and flora and fauna. Guatemala has issued more than 2,500 legal instruments; however, only 65 percent of those regulations required by Decree 68 of 1986 have been approved at different government levels (from congressional to municipal). Such scattered approval has led to differences in their authority and stability and more importantly, a lack of coherent management. For example, for regulations about water resource management, the country's Health Code

regulates water quality for human consumption, the Law of Protected Areas establishes actions to protect water basins, the Electricity Law regulates river rights of way for hydroelectricity generation, and COGUANOR establishes the minimum standards for potable water. Although the water sector relies on the greatest number of regulations, it lacks a framework for sustainable water resource management that defines institutional responsibilities for its management.

The legal framework also relies too heavily on command-and-control instruments that treat violations as a crime, but economic incentives to promote compliance and achieve the desired conduct are not yet in place (see 5.7).

This report recommends — in addition to the regulation on wastewater discharges that is in the process of being issued — in the short-term prioritizing the modification or issuance of the following legal instruments:

- Internal legal framework for the Ministry of Environment and Natural Resources, including the functions of the Consultative Council.
- Emissions regulations for fixed and mobile sources.
- COGUANOR standards, particularly for water, air, and environmental services.
- Review and analyze legal frameworks that pertain to the Penal Code. This activity should be the focus of a national meeting of international and national legal experts with the objective of producing proposals for discussion in Congress.
- Assess gaps at the sectoral, institutional, and spatial levels as a basis to modify the sector's legal framework (Decree 68-86).
- Develop proposals for needed laws, such as the Water Law, Citizen Participation Law, and Law establishing Public Consultation.

5.3 Promote Compliance with Environmental Laws

Despite the legal and administrative advances that MARN has made, one of greatest challenges to the sector is compliance with environmental laws, regulations, and standards. Compliance has centered on the use of environmental assessments. In addition, the treatment of environmental infractions in the country's Penal Code does not allow evidence that would lead to corrective actions. A definition of what constitutes environmental damage is also lacking, making it difficult to apply sanctions with discretion. The system, however, is designed to sanction or prohibit actions that the country does not have the capacity to monitor. To confront these challenges, the report recommends developing incentives to promote compliance accompanied by credible sanctions that are based on clear and cost-effective standards.

The report also recommends that MARN lead a legal reform that considers modifying the Penal Code, the legal framework for the environment sector (Decree 68-86), and the issuance of needed sectoral laws, such as a water resources management law, a law on citizen participation, and a law on public consultation. Institutional strengthening and

technical assistance will be required to support the definition of technical standards and monitor compliance.

To improve incentives, the report recommends:

- Greater coordination with private organizations that promote corporate social responsibility and with business councils and other agencies that promote international environmental certification (e.g., ISO).
- Conducting cost-benefit analyses of other instruments that promote environmental stewardship.
- Reactivating the Guatemalan Fund for the Environment (FOGUAMA) to provide financial resources for technical assistance, certification, and information gathering.

5.4 Improve Effectiveness and Efficiency of Environmental Management

Since the enactment of EIA regulations in 2003, the Government has made great strides in evaluating the significance of environmental and social impacts associated with development projects. Despite significant resource limitations, MARN has made noticeable progress in implementing the EIA system. However, "fine tuning" the current EIA system (i.e., improving each of its components — screening, scoping, public participation, monitoring, and enforcement) will not be enough to provide Guatemala with an efficient and effective way to address the environmental impact of projects. MARN should consider delegating some functions to the environmental units of other ministries and municipalities and concentrate on assessing only those projects with significant, sensible, or unprecedented environmental impacts. MARN should also review the role that EIA plays in environmental management and look for additional policy instruments (such as economic incentives and emission standards) that could address environmental impacts in a more effective and efficient way.

The following key recommendations are provided to help the government continue to improve the efficiency and effectiveness of Environmental Management. The first three recommendations are meant to improve the "environmental management system" by delegating some responsibilities and by developing and applying additional instruments. The remaining recommendations are aimed at improving components of the EIA process.

5.4.1 Delegate Some Responsibilities to Municipalities and Environmental Units of Other Ministries

Despite recent worthy improvements in screening, MARN still has to handle close to 2,000 EIAs each year. Given their relatively minor and repetitive impacts, most of these EIAs could be handled by either the environmental units of other ministries or by municipalities (under the guidance and supervision of MARN). This would allow MARN to carefully evaluate the projects that deserve closer attention.

5.4.2 Develop and Implement Additional Regulations

There is an overall lack of key environmental legislation and regulations. Despite whatever improvements could be made to the EIA process in Guatemala, there remains a

crucial need to implement key regulatory standards for discharges to air, soil, and water. This should be a priority and form a key part of improving the environmental management process by not over-burdening the EIA process and bringing in additional instruments better suited to deal with most pollution problems.

5.4.3 Strengthen Links Between EIA and SEA

With the assistance of CCAD/IUCN and other organizations, undertake pilot studies for SEAs in Guatemala. Prospective pilot projects include:

- Northern inter-oceanic highway (Franja Transversal Norte).
- Tourism, including Mundo Maya.
- Policies for the mining and energy sector.
- Ports and airports.
- International watersheds (in collaboration with CCAD).

5.4.4 Improve the Use of Environmental Assessment Tools

Improve the efficiency of the environmental screening process. At present, the screening process does not assess the severity of impact of proposed projects. The screening process should be overhauled and the inclusion list (*lista taxativa*) should be strengthened to reduce uncertainty.

The use of scoping as a tool in environmental assessment and to involve the public early in the EIA process should be promoted by training and revision of the generic EIA terms of reference.

Although the Regulation for Environmental Evaluation, Control and Follow-up (No. 23-2003) states that seven environmental tools, or instruments, are available, only three are actually used. Consideration should be given to expanding the use of strategic environmental assessment, cumulative effects assessments, and environmental risk assessment.

As recommended by CCAD/IUCN, a project should be implemented to develop best environmental practice manuals for certain industries (e.g., mining). These could easily be developed from existing World Bank Group resources such as the IFC EHS guidelines.

Consider expanding this review to undertake a formal analysis of EIA effectiveness within MARN by conducting an EIA audit focusing on: (i) reduction of the overall need for EIAs by improving efficiency of the screening process, (ii) improving approval time, (iii) developing standardized procedures for EIA review, (iv) reviewing the performance of environmental follow-up and monitoring, and (v) reviewing participation processes.

5.4.5 Strengthen the Follow-up and Compliance Process

Implement a review and follow-up process by establishing a dedicated “follow-up” unit. Undertake the following:

- Link the monitoring and follow-up unit to the legal compliance unit.
- Prepare a manual on EIA follow-up and develop standardized procedures.
- Consider charging project proponents of the "large and special" projects that MARN will continue to evaluate for monitoring and follow up (following the successful Colombian experience).

5.4.6 Strengthen Public Participation in the EIA Process in Guatemala

- Develop a standard guide to public participation in MARN and make it available to all proponents. A manual on public participation has been prepared by CCAD and could be adopted specifically to Guatemala with a training program.
- Undertake pilot projects in various large infrastructure projects as demonstration projects to show the benefits of public participation.

5.4.7 Improve the Institutional Capacity of MARN and the Environmental and Planning Units in Key Ministries

Once the role that EIA will play has been decided (in light of the additional management instruments that must be developed, e.g., emission standards) an analysis of EIA capability in MARN should be conducted. This should include a review of technical capabilities, salaries, work conditions, standardized administrative procedures, and provision of a comprehensive and inclusive training program.

The planning capacity of MCIV should also be strengthened to develop sector action plans in an integrated manner (including environmental considerations).

5.5 Support the Decision Making Process by Establishing a Unified Environmental Information System, and Promoting Public Participation

5.5.1 Unify Environmental Information Systems

The country currently relies on isolated information systems. Although they do store useful environmental information, it is not gathered in such a way nor is it sufficiently comprehensive to be useful to decision makers and civil society (see 5.8). Those information systems most utilized include the Geo-referenced Information System (SIG) and the Health Management Information System (SIGSA). University investigation centers, primarily the Universidad Rafael Landivar, Universidad del Valle, and Universidad San Carlos de Guatemala, as well as private centers such as IDEADS also maintain environmental information systems.

In order to create a unified information system in which data are gathered in a format consistent with other database systems, the report recommends that in the short term MARN, through the Manager of the Environmental Cabinet, the Consultative Council, and the National Institute of Statistics, identify institutions that collect data in the country as well as what information they have available. Indicators should be defined that can be used by decision makers to inform policy development and measure implementation performance. To support the monitoring of indicators, an agreement should be reached

among these institutions on report frequency, data collection instruments, and responsibilities for data collection. In the medium term a pilot exercise should develop this information system and disseminate data on implementation performance. Based on the results of this exercise, the information system could then be institutionalized to publicly provide information via MARN's website.

5.5.2 Introduce Periodic Analytical Work to Set Priorities

Both the richness of natural resources and severity of environmental deterioration in Guatemala make a strong argument for the role of environmental resources in reducing poverty, fighting hunger, and lowering child mortality. Policymakers who set environmental standards need to be aware of the likely consequences of environmental degradation on the economy, while economic (and sectoral) policymakers must consider the environmental implications of current and projected patterns of consumption and production. MARN should develop periodic analytical work such as environmental accounting to determine the cost of environmental degradation.

5.5.3 Promote Public Participation in the Environmental Agenda

Improving institutions and organizations is not only about building and strengthening legal frameworks and organizations, but is also about building citizen engagement and voice. While improvements to legislative oversight and administrative mechanisms do help, they are insufficient unless accompanied by increased demand from citizens and other stakeholders for better access, quality, and responsiveness in the delivery of public services. Greater citizen involvement can be facilitated by disclosing data on environmental quality, enabling public review of proposed laws and regulations, and enhancing spaces and opportunities for citizen and civil society engagement with political actors. Participatory methods such as expanded data collection and analysis can then be used by the public to hold policymakers accountable, thus enhancing both public sector accountability and performance — the demand side of governance.

This report recommends that:

- The Consultative Council play an active role in policy formation and inter-institutional coordination.
- Consultation mechanisms on proposed policies, laws, regulations, and norms be improved by organizing workshops or target groups to discuss proposals.
- To improve oversight of mitigation plans and social audits, the experience of the Association of Community Environmental Monitoring (AMAC) should be studied.
- Coverage and frequency of both public disclosure programs and environmental education should be increased.

5.6 Manage the Environmental Implications of DR-CAFTA

Guatemala environmental challenges could be accentuated by expanding opportunities offered by DR-CAFTA. But the agreement also offers opportunities to enhance the policy, legal, and regulatory framework and thereby create incentives to conduct

operations in an environmentally sound and equitable manner. There are three areas that require particular attention:

5.6.1 Tackle Industrial Pollution Because Growing Pressure from Trade Expansion and Privatization Could Further Worsen the Situation

There is a need for a more flexible and efficient regulation that nevertheless provides strong incentives for polluters to change their ways. Environmental assessments do not fulfill the need for an incentive-based regulation and monitoring system. Market-based instruments such as pollution taxes/charges combined with other strategies such as public disclosure could be introduced in a gradual manner pending the implementation of a reasonable and acceptable monitoring and enforcement mechanism.

5.6.2 Build Capacity to Meet International Standards

Gaining access, especially to U.S. markets offered by DR-CAFTA, not only requires proper documentation of the entire production process, but also specific obligations to register food and medicine and comply with plant and animal sanitary regulations and food safety labels/certificates. Although there is some transition assistance provided, Guatemala will need to build capacity and create policies and programs that will help producers meet export/import requirements and strengthen national systems to meet sanitary standards of the U.S. and world markets.

5.6.3 Create a Strategy to Promote Agricultural Growth that Encompasses Broader Reforms at the Local Level

Any agricultural expansion that could arise from opportunities offered by DR-CAFTA must be accompanied by developing an incentive structure targeting small-scale and landless farmers in order to ensure that it doesn't lead to further migration, frontier expansion, and accompanying deforestation. For both agricultural and non-agricultural growth there is a need for better natural resource management of land, forest, and water resources in a more equitable and sustainable manner. This will require an appropriate legal and institutional framework (including enforcement) that recognizes the rights of indigenous groups to natural resources, and improves their access to these assets.

I. Introduction

1. Background and World Bank Assistance

1.1 Policy Challenges

Guatemala's difficult colonial past and a debilitating 36-year civil war left a legacy of extensive poverty and inequality, poor social indicators, and deep social, ethnic, and political divisions. Since signing of the Peace Accords in 1996, Guatemala has made substantial progress in consolidating peace and democracy. While progress in socioeconomic development has been uneven, there have been important gains in education and health coverage, sustained increases in social sector spending, improved coverage of basic utility services, and better management of public finances, among other improvements. Unfortunately, progress has been slower than expected in several important areas, including economic growth rates.

As in other post-conflict situations (e.g., El Salvador), peace created opportunities for environmental protection. In order to strengthen institutional capacity to address environmental problems, the Ministry of Environment and Natural Resources (MARN) was created in 2001 and the regulatory framework was significantly expanded.[14] Despite these institutional efforts, Guatemala still faces considerable environmental challenges:

- *Over-exploitation of water resources.* Municipalities adjacent to Guatemala City have a 2.5 cubic meter per second water deficit, and between 1970 and 2001 there was, on average, a 20-25 percent reduction in water flow in the country's rivers.[15]
- *Water pollution.* On average, five children die every day from water-borne diseases. The annual health cost of these diseases — caused by poor quality water, sanitation, and hygiene — is 1.6 percent of GDP.
- *Air pollution (indoor and outdoor).* Acute respiratory infections (ARI) were the leading cause of death and illness in Guatemala between 1970 and 2000. The annual health cost of air pollution is 1.2 percent of GDP (0.95 percent indoor air pollution and 0.25 percent outdoor air pollution).
- *Deforestation.* The annual rate of deforestation is 1.7 percent (more than three times the average rate in Latin America and the Caribbean).[16]
- *Soil and land degradation.* About 10 percent of land is highly degraded and 63 percent could become highly degraded in the near future. The annual cost of soil and land degradation amounts to 0.55 percent of GDP.
- *Vulnerability to natural disasters.* Because of its geographic location, Guatemala is highly vulnerable to natural disasters such as droughts, flooding,

14. There were 69 environmental regulations (normas) before 1990. Almost 1,000 regulations were passed between 1991 and 2000, the great majority in the second half of the decade.
15. UNEP. GEO Centroamerica Perspectivas del Medio Ambiente 2004.
16. UNEP, 2003.

volcanic eruptions, and earthquakes. This environmental vulnerability is greatest in the upper parts of the three main watersheds, which are also the most densely populated areas. These areas have shrinking natural forests, high rainfall, and steep topography, characteristics that increase the vulnerability of people in the middle and lower parts of the water basins, where the greatest damage from natural events can easily become disasters. The average annual cost of natural disasters is 0.57 percent of GDP.

These problems pose a considerable socioeconomic cost — 2.86 percent of GDP annually when only the health costs of a degraded environment are considered. Costs are especially high among vulnerable groups such as indigenous people and poor children. At the same time, the country needs to improve competitiveness and promote investment to reduce poverty through much needed economic growth[17] and improve human conditions. Many economic policy decisions in the near term may have long-term environmental consequences, but perhaps more importantly, some choices will be irreversible or can be reversed only with great difficulty.

Some of the most difficult issues may involve trade-offs between preserving natural systems and pressing forward with economic growth (developing oil and gas fields, and expanding the road network and agricultural frontier). These will pose difficult challenges for Guatemalan environmental institutions, which must be able to address those challenges by finding and taking advantage of all win-win opportunities; avoiding unrealistic regulations that might hinder competitiveness and damage the environment (because they are not credible or enforceable); carefully evaluating unavoidable trade-offs; and making and enforcing decisions that benefit current and future generations. This is especially relevant because adoption of the Dominican Republic-Central America Free Trade Agreement (DR-CAFTA) is expected to accelerate economic growth and expand infrastructure, which in turn should promote investment and expand exports.

1.2 Development Plan and World Bank Assistance

Guatemala's development challenge is to enhance economic growth, reduce poverty, and improve social indicators. The current Government is aware of the challenge and has laid out an ambitious development program for building social solidarity and trust as well as improving competitiveness. Its policy document, *¡Vamos Guatemala!,* rests on three strategic pillars:

- *Guate Solidaria* is designed to promote social solidarity, reduce inequality, and achieve greater economic integration through, among other actions, strengthening social protection programs for vulnerable groups and accelerating investment in education and health.
- *Guate Crece/Compite* is designed to drive economic growth to above 4 percent by, among other actions, emphasizing trade expansion (taking advantage of the opportunities provided by DR-CAFTA), expanding

17. The Bank's Country Economic Memorandum indicates that the economy needs to grow at about 5 percent (2.4 percent per capita) annually to achieve MDG targets.

infrastructure, strengthening the financial sector, improving the investment climate, developing high-potential sectors (such as tourism and forestry) and promoting quality standards and technological innovation.

- *Guate Verde* is designed to promote environmentally sustainable development by strengthening institutional capacity for environmental policy analysis, implementation, monitoring, assessment, and evaluation, as well as strengthening management of protected areas, among other actions.

To support the government's development plan, the World Bank's Country Assistance Strategy (CAS) includes a strategic program of lending and non-lending services. About one-half of lending will be delivered through a series of programmatic Development Policy Loans (DPLs) mainly focused on economic growth. Key areas include trade expansion, investment climate improvements, infrastructure, and financial sector reform. The other half will be channeled through investment program interventions aimed at reducing inequality and poverty and continuing to strengthen governance.

2. Rationale, Objectives, and Value-Added

2.1 Rationale

World Bank Development Policy Lending (OP/BP 8.60) requires the Bank to determine whether specific country policies supported by a DPL operation are likely to have significant effects on the country's environment and natural resources. Where significant effects are likely to result from such policies, the Bank draws on relevant country or sectoral environmental analysis to assess the borrower's systems (including the institutional framework) for reducing adverse effects and enhancing positive ones associated with the specific policies being supported.

In the case of Guatemala, expansion of trade and infrastructure requires such an examination of the adequacy of country policies and institutional frameworks. To address the environmental aspects of trade and infrastructure expansion, environmental institutions will have to:[18] (i) gather, process, and present information in ways that are useful to set priorities, make decisions, promote participation, and track progress; (ii) negotiate change and forge agreements; and (iii) execute decisions by enforcing agreements and regulations and implement policies. The CEA identifies gaps in the institutional capacity to carry out these functions and make recommendations to fill these gaps and build capacity.

2.2 Objectives

The objective of this CEA is to analyze the efficiency and effectiveness of Guatemala's environmental policy and institutional framework to address current and future environmental issues with special emphasis on those arising from trade liberalization and infrastructure investments. The CEA identifies policy and institutional gaps and provides politically feasible and cost-effective recommendations.

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18. See World Development Report (2003)

2.3 Value-Added

The CEA will help the government make difficult decisions related to: (i) protecting and restoring key environmental services essential for long-term sustainability, (ii) rapid short-term expansion of trade and infrastructure, (iii) reducing logistical and regulatory costs to improve competitiveness, and (iv) increasing social and corporate responsibility in the stewardship of the environment to meet national, regional, and global commitments.

The CEA will also provide policy options and practical guidance for decisions related to the expansion of trade and foreign direct investment (FDI). This is particularly relevant for Guatemala because the country's primary exports (coffee, sugar, bananas, chewing gum, and oil)[19] are natural-resource intensive and increased productive activity in those sectors could lead to greater pollution and stress on environmental quality and resources (particularly in the absence of adequate regulatory enforcement and sufficient information on environmental costs). For infrastructure expansion it is expected that the CEA will provide an improved analytical framework that incorporates environmental costs and benefits — such as the cumulative environmental impacts of multiple infrastructure projects — into the assessment of investment programs and policies.

3. Organization of this Country Environmental Analysis

Section I of the CEA describes the country's main environmental policy challenges, the Bank's assistance to Guatemala's development program, and the rationale, objective, and value-added of the CEA. Section II provides a brief description of the key environmental issues in Guatemala. Despite important progress in curbing environmental degradation, Guatemala still faces some serious environmental problems. For example, a study commissioned for this report estimated the health costs of environmental degradation at 2.8 percent of GDP.

Section III describes and analyzes the institutional (rules of the game) and organizational (players) frameworks. As part of the Bank's approach to preparing a CEA, this report explores not only the basic institutional framework (policies, laws, regulations, instruments), but also the organizational and human capacities to enforce them in an effective, efficient, transparent, and accountable way.[20] The synthesis of these two dimensions discloses the key strengths and weaknesses of Guatemala's institutional capacity to address environmental problems.

Section IV describes both the potential challenges and opportunities that the environment and natural resources in Guatemala may face as a consequence of DR-CAFTA. The section aims to broaden the understanding of environmental issues of DR-CAFTA in Guatemala by conducting a systematic analysis of trade and investment patterns. The analysis provides guidance on institutional strengthening as Guatemala continues to

19. Informe Nacional del Estado del Medio Ambiente 2003.
20. The process was based on an extensive review questionnaire approved by the government and a series of bilateral discussions with key stakeholders.

liberalize its trade and investment regime. Section V describes the infrastructure needs and programs and the colossal challenge that the existing and already overburdened policy instruments (mainly the Environmental Impact Assessment process) would face in trying to manage the environmental implications of infrastructure expansion. The section identifies measures to improve the EIA and to complement it with other policy instruments in order to address the environmental implications of infrastructure expansion in a more effective way, at the same time avoiding unrealistic regulations that may hinder competitiveness and investment. The analysis benefited from workshops and meetings with both environmental authorities and authorities responsible for infrastructure projects.

Section VI summarizes the strengths and weaknesses of the institutional framework with special emphasis on the characteristics required to address environmental issues arising from trade liberalization and infrastructure expansion. This section also identifies policy recommendations and describes the role that the World Bank could play in helping the Government of Guatemala strengthen its institutional capacity to meet the environmental challenges that DR-CAFTA and the ambitious infrastructure expansion program will pose.

II. Key Environmental Problems

Managing Guatemala's rich but fragile natural resources and protecting environmental quality is critical for the country's long-term economic growth and social progress. This applies not only in the traditional sense of minimizing environmental health costs and damage to the natural resource base, but also in the context of an increasingly open economy trying to attract foreign investors and bring the agricultural, industrial, and tourism sectors in line with more profitable markets. Guatemala, however, still faces severe environmental degradation problems, especially in the areas of environmental health and natural resource degradation.[21]

1. Natural Characteristics of Guatemala

Guatemala has a land area of 108,889 square kilometers. It is bordered by Mexico to the north and west, has a long coastline (255 kilometers) on the Pacific Ocean to the south, and a shorter coastline to the east (100 kilometers) on the Caribbean, and shares land borders with Belize, Honduras, and El Salvador. While Guatemala is relatively small, it has high cultural and natural diversity.

With the exception of the Petén and the Pacific lowlands, the country is mainly mountainous, with the highest elevation reaching 4,220 meters above sea level (Volcán Tajumulco is the highest point in Central America). The average temperature at sea level is 27 degrees C on the Pacific coast and 28.2 degrees C on the Atlantic coast. Average relative humidity varies from 60 percent in the eastern dry zones to 85 percent in the north (URL-IIA 2004).

The country is traversed by the Los Andes cordillera, which is divided into two main ranges, the Sierra Madre and the Cuchumatanes. The Sierra Madre includes the central altiplano and a series of secondary ranges that reach eastward into El Salvador and Honduras. The Cuchumatanes range lies to the north of the Sierra Madre and crosses the country from the Mexican border in the west to the Atlantic Ocean in the east. The high plateaus of this range are the highest in Central America, with altitudes exceeding 3,000 meters above sea level. The geologic formation that stands out within this range is a mountain system of limestone and dolomitic composition that creates a karstic formation. In addition to these mountain ranges, Guatemalan topography includes valleys, plateaus, foothills, and plains created by the various geological processes that have molded the country.

Guatemala's waters escape the mountains via 38 main watersheds into three water drainages: the Pacific, the Caribbean, and the Gulf of Mexico. The most important rivers are the Usumacinta, Motagua, Sarstún, Ixcán, and Polochic. Non-marine water bodies (lakes and lagoons) cover 0.9 percent (950 square kilometers) of the country (URL-IIA 2005).

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21. This section does not undertake to describe the state of the environment in Guatemala. Rather, it reports cost estimates for the most important environmental problems in the country. For a state of the environment report see MARN and UNEP (2003) and URL-IIA (2004, 2006a).

The exclusive economic zone for fishing on the Pacific side encompasses 83,000 square kilometers. Total fishing production is 2,400 tons per year, 37 percent of which is from the Caribbean and 63 percent from the Pacific.

Guatemala is one of the eight main sources of origin for cultivated plants, and despite its small size it is the twenty-second most bio-diverse country in the world. It is rich in diverse ecosystems, species, and genetic material, including commercial plants such as corn, beans, cotton, cacao, and avocado. The country includes five distinct freshwater eco-regions and nine terrestrial eco-regions, 14 life zones, and seven biomes. The eco-regions include four types of mangrove, four humid forests, two montane forests, two dry forests, one xeric forest, and one mixed forest. Two of the terrestrial eco-regions are considered globally important: Central American pine-oak forest and Chiapas Depression dry forest (FIPA, 2002).

2. Summary of Key Environmental Problems

2.1 Water Scarcity

Water scarcity is increasing and by 2025 availability is expected to be seriously compromised by a combination of growing demand and pollution. Some watersheds already have shortages. There is a serious decline in available water due to pollution, mainly caused by direct and indirect liquid effluents from both municipal and industrial sources. Municipal and illegal garbage dumps also contribute to this problem. The legal framework for water is complicated because there is no framework water law. Water rights are ill-defined and managed by political and administrative divisions. Each institution is concerned only with its own interests and does not consider watershed management or competing uses for water resources. In general people have little awareness or knowledge of water scarcity and consider water to be an abundant resource of little value.

2.2 Polluted Water

Polluted water and water-borne diseases also pose a difficult challenge. In 2000, acute diarrheal illness was the second leading cause of both morbidity (45.1 per 1,000) and mortality (3.6 per 10,000), exceeded only by respiratory infection or pneumonia. Forty-three percent of infant mortality is due to diarrheal illness, which causes an average of five deaths per day among children under one-year-old. The health costs of diarrheal illnesses are 1.6 percent of GDP.

Box 1. Pollution in Rural Areas: The Health Burden of the Most Vulnerable People

Guatemala's rural population is about 60 percent of the total population, including 81 percent of the poor and 93 percent of the extreme poor. Three-quarters are considered poor and one-quarter extremely poor. Pollution is usually considered an urban problem, but rural people in Guatemala are significantly affected. Pollution in rural areas causes pain, suffering, disability, and in too many cases, death.

Although not exclusive to rural areas, indoor air pollution is more common in rural areas than in urban areas mainly because of the fuels that rural people use. Statistics from the Ministerio de Salud Pública y Asistencia Social (MSPAS) in Guatemala indicate that between 1997 and 2000 acute respiratory infection (ARI) was the single most important cause of morbidity and mortality in Guatemala

Estimated Annual Health Effects of Indoor Air Pollution in Rural Areas

Parameter	Rural cases	Rural cost (million quetzals)	Percent of GDP
Acute respiratory illness (ARI)			
Increased mortality for children (<5 years)	1,620	870	0.4
Increased morbidity for children (<5 years)	2,200,000	330	0.2
Increased morbidity for adult females (>30 years)	315,000	80	0.04
Chronic obstructive pulmonary disease (COPD)			
Increased mortality for adult females	195	125	0.1
Increased morbidity for adult females	2,050	90	0.04
Total cost		**1,495**	**0.7**

Inadequate quantity and quality of potable water, sanitation facilities, and improper hygiene conditions cause various illnesses in adults and children, mainly diarrhea. Once again, the rural population is in a more difficult position to cope with this problem. Pollution affects the health of rural people and their ability to work and learn, making it harder to leave poverty behind.

Estimated Annual Health Effects from Diarrheal Illnesses Attributed to Poor Quality Water, Sanitation, and Hygiene in Rural Areas

Parameter	Rural cases	Rural cost (million quetzals)	Percent of GDP
Increased mortality for children (<5 years)	1,665	900	0.4
Increased morbidity for children (<5 years)	6,200,000	520	0.2
Increased morbidity (>5 years)	5,000,000	410	0.2
Total cost		**1,830**	**0.8**

Source: Cost of Environmental Damage; Bjorn Larsen and Elena Strukova. World Bank; April 2006.

2.3 Air Quality

The rapid and uncontrolled growth of the Guatemala City metropolitan area, urban and industrial development, the increasing number of motor vehicles, deforestation, and the advance of the agricultural frontier have created a growing air quality crisis. Guatemala City is the only place where data about the main air pollutants that affect the environment and human health are available. Air quality monitoring shows that total suspended particles (TSP), and in particular breathable particulate matter and particles smaller than 10 micrometers in diameter (PM10), are the most serious air pollution problem in Guatemala City and significantly exceed permissible limits in most years. These pollutants affect respiratory passages, increase susceptibility to asthma and colds, exacerbate cardiovascular diseases, and cause lung cancer (USAC, 2006). The annual cost of air pollution was estimated at 0.25 percent of GDP.

2.4 Indoor Air Pollution

Exposure to airborne pollutants is even more serious in rural areas, where 86.1 percent of the population uses firewood for cooking, creating severe indoor air pollution (INE, 2003). This exposure is particularly harmful to people with chronic lung or heart disease, pregnant women, the elderly, and children. The annual cost of indoor air pollution is 0.95 percent of GDP (Box 1).

2.5 Forest Loss

The rapid rate of forest loss, which currently occurs at 73,148 hectares per year, is one of Guatemala's principal environmental problems (UVG, INAB, CONAP, 2006). The main causes include conversion of forests to unsuitable land uses that result in agricultural, forest, and production systems that are unsustainable; lack of rural employment opportunities, which forces many *campesinos* to convert forested land to agriculture or grazing; a culture deeply based in farming that to some extent conflicts with forest production systems; public policies that strongly favor agricultural development and which over the past 50 years have encouraged social and economic actors to convert forests to farming and livestock uses; uncontrolled growth of existing urban areas and new settlements; forest fires; uncontrolled grazing; selective logging in forests; and extensive use of firewood for cooking and heating.

2.6 Land Degradation

The annual cost of land degradation is estimated at 0.55 percent of GDP. Land degradation is high in 37 percent of Guatemala, and is particularly severe in the western highlands. In upper watersheds, 56 percent of the land (14.2 percent of the country) is highly degraded. This situation is urgent because of the growing conflicts in the context of declining natural capital, high levels of land degradation, and a growing population with few economic opportunities other than conventional agriculture on cleared land. The rapid degradation of these upper watersheds is cause for serious concern because they are the point of convergence for the country's three main water drainages and the source of

more than 70 percent of its rivers. Deforestation in this area is very high, with only 6,700 square kilometers of dense forest remaining (URL-IIA, 2004).

2.7 Natural Disasters

Because of its geographic location, Guatemala is highly vulnerable to natural disasters such droughts, flooding, volcanic eruptions, and earthquakes. This environmental vulnerability is greatest in the upper parts of the three main watersheds, which are also the most densely populated areas. The shrinking natural forests, high rainfall, and steep topography of these areas increase the vulnerability of populations in the middle and lower parts of the water basins, which suffer the greatest damage from natural events that can easily become disasters. About 5 percent of Guatemala (5,500 square kilometers) is classified as being at "very high" or "extremely high" risk of drought. The areas at greatest risk are in eastern valleys and in the central region in a band running from Jutiapa and Chiquimula (on the border with El Salvador and Honduras) through Jalapa, Zacapa, El Progreso, and Baja Verapaz, to Quiché on the Mexican border.

Although it is located in the subtropics, 7 percent of Guatemala (7,622 square kilometers) has a greater than 50 percent probability of having a hard frost, mainly in areas of the Sierra Madre and Cuchumatanes mountains that are higher than 2,200 meters above sea level. About 1,733 towns and villages with about 210,000 inhabitants are vulnerable to floods. The population considered to suffer from very poor nutrition is located in 45 municipalities in the departments of San Marcos (12 municipalities), Quetzaltenango (3), Quiché (8), Huehuetenango (11), Sololá (6), and Totonicapán (5). The department with the worst conditions is Totonicapán, where all municipalities have inhabitants classified as having poor or very poor nutrition, followed by Huehuetenango and San Marcos in which almost all municipalities fall into these categories (URL-IIA 2005a).

2.8 Biodiversity Loss

Biodiversity loss in Guatemala comes mainly from the loss, degradation, and fragmentation of habitats; overexploitation of resources; pollution and environmental degradation; and the introduction of exotic species. Currently, 13 percent of plant species and 34 percent of animal species (not including insects and mollusks) are considered threatened. The country's answer to these threats, in terms of *in situ* conservation of biodiversity, is the Sistema Guatemalteco de Áreas Protegidas (SIGAP), which includes 160 protected areas covering about 31 percent of Guatemala.[22] Not sufficiently addressed by the government, however, is land invasion (especially for farming and grazing), the high incidence of deliberate forest fires, and the growing difficulty of overseeing these areas, partly because the funds allocated for the administration of SIGAP have been declining since 2003 (URL-IIA, 2006).

22. As of the March 31, 2005 list of protected areas issued by CONAP.

2.9 Solid Waste

Inadequate management of solid waste is becoming a more serious problem as the population grows and consumption patterns change, increasing both the aggregate and per capita generation of garbage. Per capita garbage production is expected to stay at around 0.30 kilograms per day, of which 75 percent or more is organic material and very little of which is non-organic recyclables. Most of this waste is unsafely disposed of in open dumps. Increased generation of solid waste and major deficiencies in final disposal practices cause health problems and environmental impacts (URL-IIA, 2006a).

DR-CAFTA and a very ambitious infrastructure program represent both a challenge and an opportunity for environmental institutions in Guatemala. DR-CAFTA is expected to increase trade, investment, and economic growth, as well as improve the welfare of Guatemala's population (including the poor). However, the extent of these gains and net benefits from DR-CAFTA will depend on the country's capacity to implement complementary policies. The agreement by itself is unlikely to lead to substantial development gains without parallel improvements in areas such as infrastructure, trade facilitation, institutional and regulatory reform, innovation, and education (World Bank. 2005). From an environmental policy perspective, the challenge is to strengthen environmental institutions and policies so that they effectively protect the environment and the country's natural heritage while supporting trade-driven growth. Are the Guatemalan institutions ready to meet that challenge? What are the institutional gaps and what can be done to fill them?

III. Institutional Framework

To face its environmental challenges, Guatemala requires effective and efficient environmental policies and laws, and organizations to implement them.[23] This section focuses on the existing institutional situation, followed by an analysis of the current key players within this institutional setting. It concludes with a synthesis of the strengths and weaknesses to outline the key avenues for actions.

1. Institutional Framework (the Rules of the Game)

Guatemala entered the 21st century with a complex institutional framework to tackle environmental problems that includes policies, laws, regulations, and a series of instruments and procedures.

1.1 Environmental Policies

In Guatemala a number of documents could be considered public policy statements on the environment and natural resources. These documents include the Policy Framework on Environmental Management, Green Guatemala *(Guate Verde)*; Competitiveness Agenda; Policy of Conservation, Protection, and Environmental Improvement (PCP and MMA); Environmental Education Policy; Forestry Policy; Policy on the System of Protected Areas; and the Rural Development Strategic Agenda. Although these documents were issued on the basis of Article 97 of the Constitution and the Environmental Sector Framework Law (Decree 68-86), only the Policy Framework on Environmental Management was issued and sanctioned via Governmental Agreement. This policy framework mandates the issuance of 13 specific policies on (i) standardization of legal norms; (ii) regional environmental harmonization; (iii) waste management; (iv) conservation of hydro-biological resources; (v) soil conservation; (vi) development and conservation of natural heritage; (vii) valuation of environmental goods and services; (viii) equity; (ix) *ex-situ* conservation; (x) strengthening the country's system of protected areas; (xi) management of costal zones, oceans, and marine resources; (xii) water basin management; and (xiii) water usage management.

In addition, although these documents provide an important dimension to the country's management of the environment and contain general objectives, none rely on a solid analytical foundation or information system that would permit the country to identify its environmental priorities and orient policies toward these priorities. Table 1 shows the numerous programs sought by these policy documents. As a result, the objectives of these documents are not coordinated and lack a clear definition of the anticipated results as well as quantitative indicators. In terms of their content, the documents define six principal areas of action (see Table 1): (i) environmental prevention and territorial

23. This report differentiates between the concepts of institution and organization. Institutions include all the formal and informal "rules of the game" existing in the country, including laws, regulations, and practices. In the case of "the players", we focus on the key actors that influence environmental institutions, which includes the key entities, bodies, and "bureaucracies" in charge of developing, applying, and enforcing the institutional framework.

planning; (ii) environmental restoration; (iii) evaluation, control, and oversight; (iv) sustainable use of natural resources; (v) institutional strengthening; and (vi) coordination.

Lastly, these policy documents lack a clear definition of which entities are responsible for their fulfillment, nor specify the instruments to be applied for their implementation. Guatemala needs a clear and operational environmental policy to provide government agencies with clear mandates, direction, and resources.

1.2 Regulatory Framework

The environmental regulatory framework includes laws with different applications (Table 2). Laws of observance and general application rule on the relationship between different institutional actors. Some laws regulate sectors, while others regulate creation and/or functioning of some public entities. Norms regulate actions or procedures within a sector, and technical standards provide the basis for applying regulations. The rulings that comprise the country's environmental framework have been approved by different levels of government, resulting in differences in their authority and stability. These rulings include Law Decrees approved by Congress; Congressional Decrees approved by simple or qualified majority of the Legislature; Governmental Agreements approved by various ministries independently or in conjunction via the Executive Council of Ministers; Ministerial Agreements approved independently by ministries; Municipal Agreements approved by municipal corporations; internal institutional Ordinances that are internal resolutions of Boards of Directors or other public decision making entities; Ratified International Agreements; and other Congressional resolutions.

The country has issued more than 2,500 environment-related legal instruments. However, if the Environmental Protection Law, Decree 68 of 1986, is taken as a reference (Fig. 2), important gaps in the country's environmental regulatory framework appear, particularly in the areas of air and water resources management.[24] Laws supporting the protection and management of these resources are still lacking; regulations do not have the backing of a coherent framework. For example, the water sector relies on the greatest number of regulations, targeting its multiple uses (consumption, protection, production, etc.), but the sector does not have an integrated framework to manage water resources. To manage water resources, the country's Health Code regulates water quality for human consumption; the Law of Protected Areas protects water basins; the Electricity Law regulates river rights of way for hydroelectricity generation; and COGUANOR establishes the minimum standards for potable water.

24. Only 65 percent of those regulations required by Decree 68 of 1986 have been issued.

Table 1. Areas Covered by Guatemala's Environmental Policy Documents

Areas of action	Policy frame-work	Programs	Green Guatemala *(Guate Verde)*	Competitiveness agenda	PCP and MMA	Environmental education policy	Forestry policy	Rural development agenda
Environ-mental prevention and territorial planning		Environmentally responsible consumption						
		Natural resources inventory						
		System of environmental accounts						
		Economic valuation of natural patrimony						
		Formation and training of human resources for environmental education						
		Support the development of PYMES in ecoefficiency						
		Development of an environmental culture and dissemination of potential projects						
		Promote and support the execution of programs and/or projects for the adequate use of natural resources						
		Social participation and local development						
		Definition and application of environmental policies						

Table 1. Areas Covered by Guatemala's Environmental Policy Documents

Areas of action	Policy frame-work	Programs	Green Guatemala *(Guate Verde)*	Competitiveness agenda	PCP and MMA	Environmental education policy	Forestry policy	Rural development agenda
		Development of educational materials, corresponding to the ethnic identity of the country						
		Spatial analysis to define territorial units with economic dynamics						
Environ-mental restoration		Sanitation and environmental restoration						
		Water basin management						
		Adopting successful models and environmental best practices						
Environment-tal evaluation, control and oversight		EIA review						
		Review of pollution prevention norms						
		Adoption of international standards						
Sustainable use of natural resources		Rural sustainable production projects, renewable energy and energy efficiency						
		Promote the implementation of water resource policies and the management of solid waste						

Table 1. Areas Covered by Guatemala's Environmental Policy Documents

Areas of action	Policy frame-work	Programs	Green Guatemala *(Guate Verde)*	Competitiveness agenda	PCP and MMA	Environmental education policy	Forestry policy	Rural development agenda
		Promote organic or ecological agriculture						
		Ecological tourism						
		Promotion of ecological products and exports						
		Physical infrastructure and mega-projects						
Institutional strengthen-ing		Regulatory framework and environmental management institutions						
		Strengthening MARN's capacity						
		Decentralization to support EIA processing; environmental certifications						
Improved coordina-tion		Develop and apply participation mechanisms						
		Develop and administer public-private and civil society alliances						
		Management to obtain national and international support						

Table 1. Areas Covered by Guatemala's Environmental Policy Documents

Areas of action	Policy frame-work	Programs	Green Guatemala *(Guate Verde)*	Competitiveness agenda	PCP and MMA	Environmental education policy	Forestry policy	Rural development agenda
		Promote dialogue and collaboration with other sectors related to rural development						
		Creation of spaces for public-private cooperation						
		Definition of mechanisms to promote environmental dialogue						
		Identification of the modes of mass communication for the greatest coverage						

In addition to the regulatory weaknesses noted — gaps, overlaps, and contradictions — three general elements are most notable:

- Given that non-compliance with environmental rulings is treated as a crime, promoting compliance is a difficult (sometimes illegal) task. The regulatory framework should aim to promote compliance through achievable requirements but with credible sanctions to violators, rather than trying to change behavior by threatening criminal charges that are ultimately not enforced.
- Analytical work such as cost-benefit analysis is not conducted prior to issuance of environmental rulings, resulting in overly prescriptive and potentially inappropriate local environmental, economic, and social circumstances.
- Lack of coordination and a clear allocation of responsibilities results in rulings that can lack an entity capable of implementing their mandates or the resources (human, technical, or financial) to apply them.

1.3 Environmental Policy Instruments

The Environmental Impact Assessment (EIA) was the only policy instrument utilized for licensing purposes until 2003 when the Regulation on Environmental Assessment, Control, and Oversight established other instruments as alternatives to EIA. These instruments and the process are discussed in more detail in Chapter V, Section 2.1.

1.4 Information

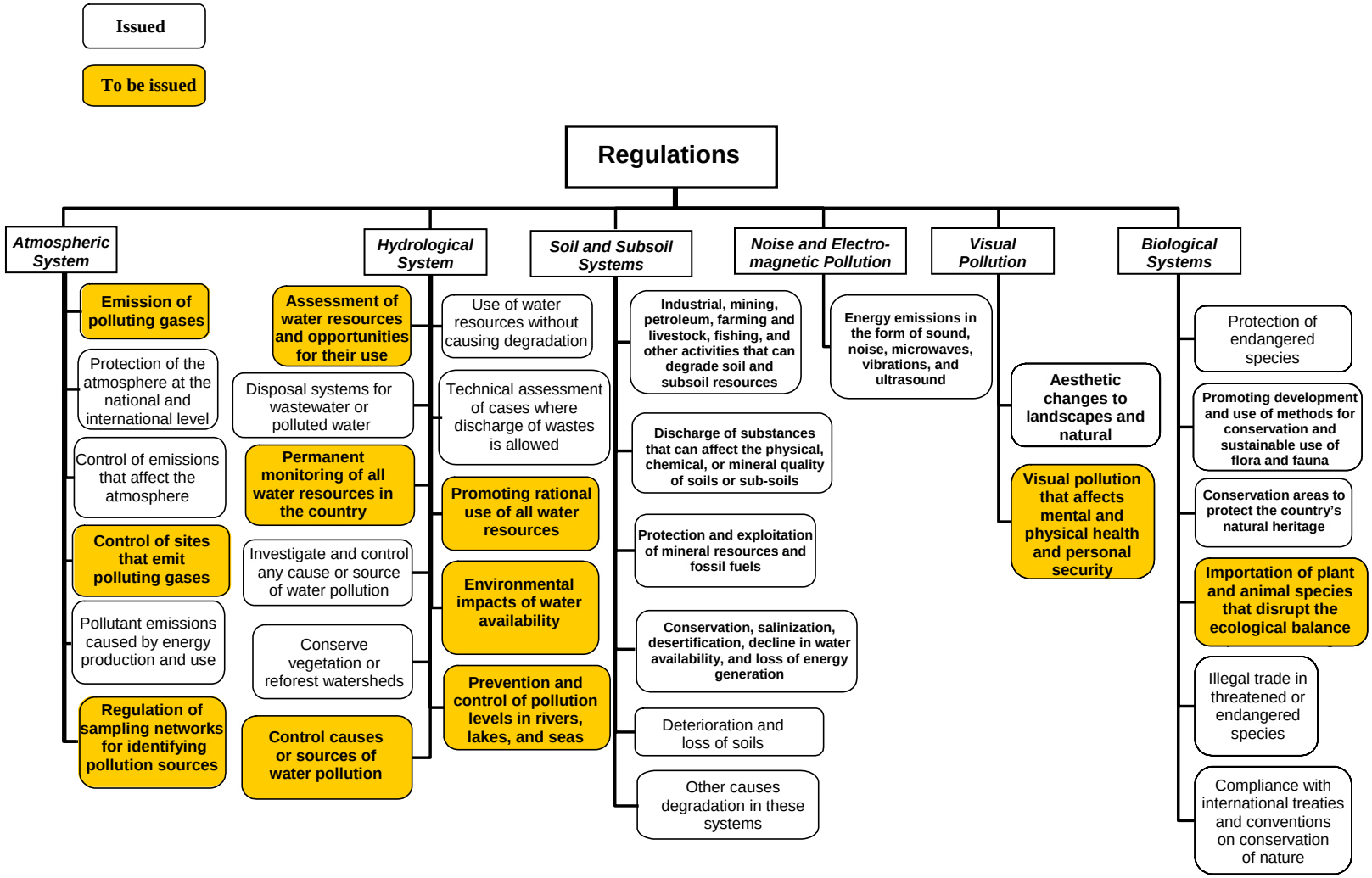
The country currently relies on multiple isolated information systems (Box 2). Although they do store useful environmental information, it is not gathered in such a way nor is sufficiently comprehensive to be useful. The most utilized systems include the Geo-referenced Information System (SIG) and the Health Management Information System (SIGSA). University investigation centers, primarily the Universidad Rafael Landivar, Universidad del Valle, and Universidad San Carlos de Guatemala, as well as private centers such as IDEADS also maintain environmental information systems.

MARN's website section on environmental information only includes the 2003 Guatemala Global Environmental Outlook report and an old (2003) description of the Environmental Information System (Sistema de Informaci'on Ambiental, SIA). The system is yet to be implemented. The IDB is helping the Guatemalan authorities with the SIA design and future implementation. The Environmental Profile of Guatemala produced by the Rafael Landivar provides important information on natural resources, pollution, and environmental quality. This environmental profile will be published bi-annually and could be part of the SIA.

Table 2. Principal Legal Instruments of the Environment Sector

Range	Constitution of the Republic																
General	Municipal Code, Penal Code Decentralization Law, Development Councils Law, Social Development Law Law of Educational Development and Law of Environmental Awareness																
Sectoral	Law of Environmental Improvement and Protection		Forestry Law	Health Code		Protected Areas Law	Hydro-carbons Law	Mining Law	Law of Vegetable and Animal Health				Marine and Fisheries Law		Law of Patrimon-ial Protection	Law of Urban Roads and Announcements	
Institu-tional	Law Creating MARN and Modification to the Executive Body Law		Authority for the Manage-ment of Lake Amatitlán	Authority for the Management of Lake Atitlán			Declaration of Other Specific Protected Areas		Creation of DIRPONA				Internal Regulations of Public Organizations MARN, CONAP, INAB, MAGA, MEM, PROCURADURIA, FISCALIA, ETC.				
Regula-tions	Regulation on Environmental Assessment, Control, and Oversight		Transport-ation of Wood	Water purification methods for human consumption and recreational use			Regulation on Hospital Liquid Wastes		Epidemiological System				Urbanization		Law on use of Motosierras	Cemeteries	
Tech-nical stand-ards	Pot-able Water Specific ations	Code of practices and specifica tions for indust-rial water usage	Bottled water for human consump-tion	Physical testing Determin -ation of color. Method of reference	Physical water testing. Determin-ation of turbidity	Determ-ination of metals. Hard-ness	Determina-tion of Metals. Calcium. Method of reference	Determin-ation of Metals. Steel.	Determin-ation of non-metallic inorganic consisten-cy. Alkalinity	Determin-ation of non-metallic organic consistency. Dissolved oxygen.			Determination of non-metallic inorganic consistency. Chloride. Method of reference		Determin-ation of non-metallic inorganic consistency. Fluoride	Determination of non-metallic inorganic consistency. Nitrogen	

Figure 1. Regulations Established by Decree 68-86, Environmental Protection and Improvement Law, by the Executive Branch



Although a great deal of environmental information is produced in Guatemala, there are still significant information gaps, such as on aquifer levels, water quality, number of existing wells, pesticide runoff, solid and hazardous wastes, and the health impacts of pollution. Both the richness of the natural resources and severity of environmental deterioration in Guatemala make a strong argument for the role of environmental resources in reducing poverty, fighting hunger, and lowering child mortality. Policymakers who set environmental standards need to be aware of the likely consequences of environmental degradation on the economy, while economic (and sectoral) policymakers must consider the environmental implications of current and projected patterns of consumption and production. MARN should develop periodic analytical work such as environmental accounting to determine the cost of environmental degradation.

Box 2. Environmental Information Systems in Guatemala

There are several environmental information systems in Guatemala, including:

Geographic Information System, operated by MAGA to support the design and implementation of sectoral policy instruments.

Environmental Indicators System, operated by INE to disseminate information on the environment and natural resources.

INAB Information System, used for forest management (does not include protected areas).

CONAP Information System, used to manage natural resources (flora and fauna in particular) in protected areas.

Bio-diversity Information Mechanism, operated by CONAP and funded by GEF.

Environmental Indicators System, operated by MARN. It was used to produce the 2003 GEO report. At present, it is not operating fully.

Strategic Environmental Information System, operated by the Rafael Landivar University and partially funded by the Netherlands, intended to help produce state of the environment reports and information to evaluate Guatemala's performance in the context of the Millenium Development Goals and other international initiatives.

1.5 Public Participation

Improving institutions is not only about improving policies, legal frameworks, and public agencies, it is also about building citizen engagement and voice. Voice and accountability are powerful tools for sustainable development. Democratic elections, legislative oversight, and improved administrative and financial mechanisms (all of which show significant progress in Guatemala) are needed but not enough to increase the legitimacy and effectiveness of government policies and actions. Increased transparency and accountability of the public sector are also needed. By involving citizens and civil society in developing and monitoring environmental policies, and by enhancing transparency and information disclosure, social accountability mechanisms are powerful tools to improve government performance to protect and manage the environment and natural resources. In Guatemala, public participation in the formulation and approval of policies and legal instruments is regulated by laws that are outside the scope of the country's environmental legal framework.

At the level of law, the Legislative Body Framework Law states that public officials should promote the presentation and discussion of legal initiatives among their constituents or the public in general. The Congressional Board says that initiatives should

be published, printed, and disseminated via: (i) the Congressional session's publication within eight days following the session in which the initiative is discussed; and (ii) a weekly bulletin, following the Congressional discussion. This bulletin should contain, at a minimum, information about the legal initiative presented to Congress; information about those who submitted the law; a description of the law; and the date the initiative was presented to the Congressional plenary. The bulletin should be published in the official newspaper given that each legal initiative is public and each citizen can purchase a copy. Also, all Congressional publications are available in a digital format on the government's website.

When an environmental law is presented to Congress, the Congressional Environmental and Natural Resources Commission, through its President or members, is responsible for seeking public opinion. This public participation mechanism, however, does show weaknesses in its scope and coverage, given that only part of the population has access to these sources, and as such, their participation is restricted.

At the level of policy design, mechanisms for public participation are not defined, resulting in inconsistent public participation in policy formulation. The public was consulted in the preparation of the Rural Development Agenda and the Policy for the Conservation, Management, and Protection of Environmental and Natural Resources. However, Guatemala has not set up a public "publish and comment" process which would require ministries and regulators to post their draft laws and regulations publicly for a reasonable review period, as most OECD countries and an increasing number of "transition" countries have done it (Box 3).

Box 3. The OECD Reference Checklist for Regulatory Decision Making

Based on a series of international studies of best practices and successful initiatives, in 1995 all OECD member countries approved landmark recommendations defining key characteristics of what should be a high-quality regulation. This recommendation includes 10 distinct tests:

- Is the problem correctly defined?
- Is government action justified?
- Is regulation the best form of government action?
- Is there a legal basis for regulation?
- What is the appropriate level (or levels) of government for this action?
- Do the benefits of regulation justify the costs?
- Is the distribution of effects across society transparent?
- Is the regulation clear, consistent, comprehensible, and accessible to users?
- Have all interested parties had the opportunity to present their views?
- How will compliance be achieved?

Source: Recommendation of the Council of the OECD on Improving the Quality of Government Regulation, OECD/GD(95)95, OECD, Paris.

On the other hand, the standardization committees that decide the content of technical standards do follow WTO transparency and accountability practices. For instance, these committees have balanced representation and use "notice and comment" procedures in

the development of technical norms.[25] On the latter issue, however, officials recognize that the time frame for public comment is too short and that there have been few comments and complaints.

At the national level, there are two public consultation mechanisms established under Guatemalan law.[26] The first is established under the EIA Regulations. These regulations require that the proponent of a project provide public notice in two newspapers with a wide circulation and that the project's EIA is available for public review prior to its approval. The EIA is then made available for review at the offices of MARN in Guatemala for 10 days, during which interested parties may provide written comments. In cases where the project may potentially affect the quality of life or present threats to human health or well-being or to the environment, MARN will publicly discuss the project in the municipality (or municipalities) where the project is proposed. Finally, MARN reviews all public comments before approving the environmental management plan and granting the environmental permit. The EIA consultation often does not reach the affected population given the high percentage of illiteracy or the population's lack of access to information.

The second mechanism established in MARN's internal regulations is a Consultative Council, however, the council has not been formed. International experience shows that consultative councils can be a very effective way to involve stakeholders in environmental policy. These circumstances refer mainly to: (i) the legitimacy of the council (including genuine representatives of the business, NGOs, research community and other stakeholders); (ii) the relevance of the agenda; (iii) credible follow up; and (iv) proper resources (travel expenses and the operation of a technical secretariat that prepares agendas, information packages, and follow-up reports).

1.6 Compliance

Compliance norms are contained under Article 29 of Decree 68-86, which establishes that any action that harms the quantity or quality of natural resources is considered an infraction and is treated as a crime in accordance with the Penal Code. MARN is responsible for issuing the respective denouncement to an appropriate tribunal. To apply environmental sanctions or sentences requires the preparation of a solid legal case with evidence of the crime and the participation of a number of agencies, including the National Civil Police (DIRPONA) to verify the crime, the Federal Prosecutor's Office of the Environmental Crime to conduct a prompt investigation, and the Courts for Crimes against the Environment to apply the sentences.

To date, MARN has presented to the Public Prosecutor's Office nine cases out of approximately 1,000 denouncements (none have been found guilty). These denouncements are imprecise and often unsubstantiated. The verification of denouncements is carried out by a delegation of personnel that lack adequate resources to

25. Representatives of the government, business, professional, and academic sectors participate and vote. So far, most norms have been adopted by consensus.
26. The Municipal Code also defines procedures for public consultation.

collect evidence (e.g., laboratory results, technical standards that specify the degree of harm, professional criteria, etc.). The law allows for alternative tools such as voluntary application plans in lieu of environmental diagnostics, but the overall emphasis is on crime and punishment. The following sanctions are considered in Article 31 of the same law:

- *Warning*, issued by MARN.
- *Specified time for a specific case to correct its actions* that harm the environment, with MARN supporting the search for viable alternatives.
- *Suspension*, when the environmental standards set by MARN are not met.
- *Confiscation of primary materials*, instruments, and materials that cause the infraction, requiring that they be placed on public auction or eliminated when they have harmed the environment.
- *Modification or demolition of constructions* that violate legal dispositions regarding Environmental Protection and Improvement.
- Fines to correct harm caused to the environment, which are valued according to magnitude.
- *Other measures to correct and repair damages* and avoid the continuation of actions harmful to the environment and natural resources.

Although one of the stated principles of environmental policy is a preference for inducing environmentally sound behavior over sanctioning, the "crime and punishment" approach, it is the dominant component of the Guatemalan strategy of environmental compliance and enforcement. The emphasis on administrative sanctions, criminal penalties, and compensation makes it difficult to develop mechanisms (like notices of violations, warnings, and compliance agreements) to encourage a higher rate of compliance. International experience has shown that promotion should be an essential component of the compliance and enforcement strategy (Box 4). These actions, when combined with credible sanctions and a track record of enforcement, may be more effective in fostering compliance than relying solely on deterrence.

Box 4. Emphasizing Compliance Promotion: The Canadian Example

Under the Compliance and Enforcement Policy for the Canadian Environmental Protection Act of 1999, Canada secures compliance through two types of activities: promotion and enforcement.

General Principles

- Compliance with the Act and its regulations is mandatory.
- Enforcement officers throughout Canada will apply the Act in a manner that is fair, predictable, and consistent. They will use rules, sanctions, and processes securely founded in the law.
- Enforcement officers will administer the Act to emphasize prevention of damage to the environment.
- Enforcement officers will examine every suspected violation of which they have knowledge, and will take action consistent with this Compliance and Enforcement Policy.
- Enforcement officers will encourage the reporting of suspected violations of the Act.

Compliance Promotion Measures

- Education and information about the Act.
- Technical information on pollution prevention and pollution control, on measures to prevent releases of substances into the environment, and on methods for analysis and monitoring.
- Consultation on regulation development and review with both the parties to be regulated and the

beneficiaries of regulation; publication of proposed regulations providing affected parties and members of the public a minimum of 60 days to comment on the text.

- Environmental Codes of Practice and Guidelines that do not have the force of law, but that can assist in adopting management practices that will result in better protection for the environment.
- Promotion of environmental audits that are internal evaluations conducted by companies, government agencies, and others on a voluntary basis to verify compliance with legal requirements and their own internal policies and standards. They are carried out by either outside consultants, employees of the company, or facilities from outside the work unit being audited. Enforcement officers do not request environmental audit reports during routine inspections.

Enforcement Activities

- Inspection to verify compliance (Inspection Program)
- Investigations of violations

Measures to compel compliance without resorting to formal court action

- Warnings
- Directions in the event of releases
- Tickets
- Ministerial orders
- Detention orders for ships
- Environmental protection compliance orders

Measures to Compel Compliance through Court Action

- Injunctions
- Prosecution
- Environmental protection alternative measures
- Penalties and court orders upon conviction
- Use of court orders upon conviction
- Civil suit by the Crown to recover costs

Criteria for Responses to Alleged Violations

Whenever an alleged violation of the Act is discovered, enforcement officers will apply the following factors when deciding what enforcement action to take:

- Nature of the alleged violation: Consideration of the seriousness of the harm or potential harm, the intent of the alleged violator, whether this is a repeated occurrence, and whether there are attempts to conceal information or otherwise subvert the objectives and requirements of the Act.
- Effectiveness in achieving the desired result with the violator: The desired result is compliance with the Act within the shortest possible time and with no further occurrence of violation. Factors to be considered include the violator's history of compliance, willingness to cooperate with enforcement officers, evidence of corrective action already taken, and the existence of enforcement actions under other statutes by other authorities as a result of the same activity.
- Consistency in enforcement: Enforcement officers will consider how similar situations were handled when deciding what enforcement action to take.

Source: Canadian Environmental Protection Act, CEPA, 1999; http://www.ec.gc.ca/CEPARegistry.

2. Organization Analysis

This section examines the principal environmental organizations with regulatory, normative, and implementation attributes. The principal organizations within the environmental sector that also have a regulatory role include the Ministry of Environment and Natural Resources (MARN), the Ministry of Agriculture and Livestock (MAGA), the Ministry of Public Health and Social Assistance (MSPAS), the Ministry of Energy and Mines (MEM), the National Council of Protected Areas (CONAP), and the National Institute of Forests (INAB). Two important organizations with environmental attributes that provide direct support to the presidency include the Planning and Programming Secretariat of the Presidency (SEGEPLAN) and the Division of Nature Protection of the National Civil Police (DIPRONA). In addition, those institutions that comprise the Executive Body can also be regulated entities in that they execute works or activities that can cause environmental damages.

In the local government arena, municipalities are responsible for both coordination and consultation. As such, a number of Urban and Rural Development Councils have been formed at the national, regional, departmental, municipal, and community levels (see Box 7).

2.1 Ministry of Environment and Natural Resources (MARN)

2.1.1 MARN's Functions

The Ministry of Environment (MARN) was created by Government Agreement No. 186-2001 and Reforms to the Executive Body Law on November 30, 2000, in which Article 3 added MARN as the ministerial body responsible for "formulating and executing policies related to its field: complying and ensuring compliance of the regime for conservation, protection, sustainability and environmental improvement, and the country's natural resources, and citizens' rights to a healthy environment; and a reduction in environmental degradation and the loss of natural patrimony."

The majority of MARN's mandated functions are oriented toward formulation of policies in coordination with other authorities and only one section under Article 3 mentions MARN's responsibilities for environmental management. In practice, however, MARN's actions have been centered on the review and processing of Environmental Imapct Assessments (EIAs). In addition, in the law creating MARN, Article No. 2 places MARN with the responsibility of developing and applying the regulatory framework. This single article denotes an enormous responsibility for the Ministry, which is particularly challenging without a long-term vision, plans, and agendas for the medium and short term, and clear priorities. (Fig. 3)

The transverse nature of environmental issues adds an additional challenge to the Ministry given that it requires a high degree of coordination among all sectors involved in policy implementation. Mechanisms are therefore needed that foster creation of a working team at the highest level that includes representation from all these sectors.

2.1.2 Functioning of the Ministry

MARN's current legal framework gives it the responsibility to formulate policies in coordination with other environmental organizations. This responsibility falls under MARN's General Office for Policies and Strategies (comprised of five staff; Table 3). Some of MARN's offices hold a high degree of administrative responsibility such as the Office for Environmental Management and Natural Resources (DIGARN). This office is responsible for evaluation and oversight of EIAs. It has 15 staff who are unable to meet the current demand for EIA reviews. This office has been able to reduce the time required for EIA reviews, particularly for those projects that do not represent a significant risk to the environment.

Table 3. MARN's Personnel by Department (as of March 2006)

Department	Number of staff	Percentage
Minister's Office	15	4
State Offices (Delegaciones)	154	42
Enforcement	13	4
Environmental Management	33	9
National Coordination	7	2
Management and Finance	20	5
Social Participation	6	2
Policy and Strategy	5	1
Human Resources	7	2
Computing (Informatica)	6	2
Projects and Programs	55	15
General Services	31	8
Other Units	18	5
Total	**370**	**100**

Source: MARN

MARN's Office for Enforcement also holds a high degree of administrative responsibility given that it is responsible for managing the process of reporting environmental crimes. This process involves adequate coordination with other governmental agencies and effective management of the proceedings delivered to the department. As with other offices within MARN, it has limited resources (only 15 staff) and important responsibilities.

MARN's Office for Social Participation has been the driving force behind the Environmental Education Policy in conjunction with the Ministry of Education. In addition, there are two other offices within MARN, including the Office for National Coordination, which is responsible for administering departmental delegations (154 staff). Its main activity has been to collect EIAs.

2.1.3 Allocation of Financial and Human Resources

MARN is one of the smallest ministries in Guatemala, where even some Presidential Secretariats rely on larger resources.[27] Since its creation six years ago, the budget approved for MARN has increased only 12 percent. On the other hand, MARN's implementation of budgetary resources has improved, as shown in Table 4.

With respect to MARN's budgetary program allocations, the majority of resources are assigned to the Environmental Management Program, which absorbed 46.6 percent of the budget for 2006, while Natural Resource Conservation Management, the core task, represented only 11.7 percent of the budget (Table 5).

In addition, 62 percent of MARN's resources were assigned for salary payments. Table 6) distinguishes between MARN's operating and investment costs for 2006.

Table 4. Budgets Approved for MARN, 2002–2006

Year	Approved budget (US$)	Budgetary execution (%)	Percent of total budget of the Central Government	Percent of GDP	No. of personnel
2002	4,745,744	87	0.155	0.020	343
2003	4,599,018	87	0.123	0.018	348
2004	5,263,130	84	0.136	0.019	348
2005	5,232,197*	96	0.123	0.016	371
2006	5,328,026*	-	0.108	0.015	371

Note: External grants are included in the total budget amount.
Source: Ministry of Finance (MINFIN) and MARN

Table 5. Program Budget Allocations for 2006

PRG	Program name	2006 Allocations (US$)	Percent of total
1	Central Activities	1,944,769	36.5
11	Environmental Management	2,484,369	46.6
12	Environmental Education and Promotion	210,357	3.9
13	Management for Natural Resource Conservation	622,975	11.7
99	Unallocated	65,634	1.2
	Total	5,328,103	100

Source: Ministry of Finance (MINFIN) and MARN

27. These figures only refer to MARN's budget. See Table 6 for the aggregated budgetary allocations.

Figure 2. Organization of the Ministry of Environment and Natural Resource

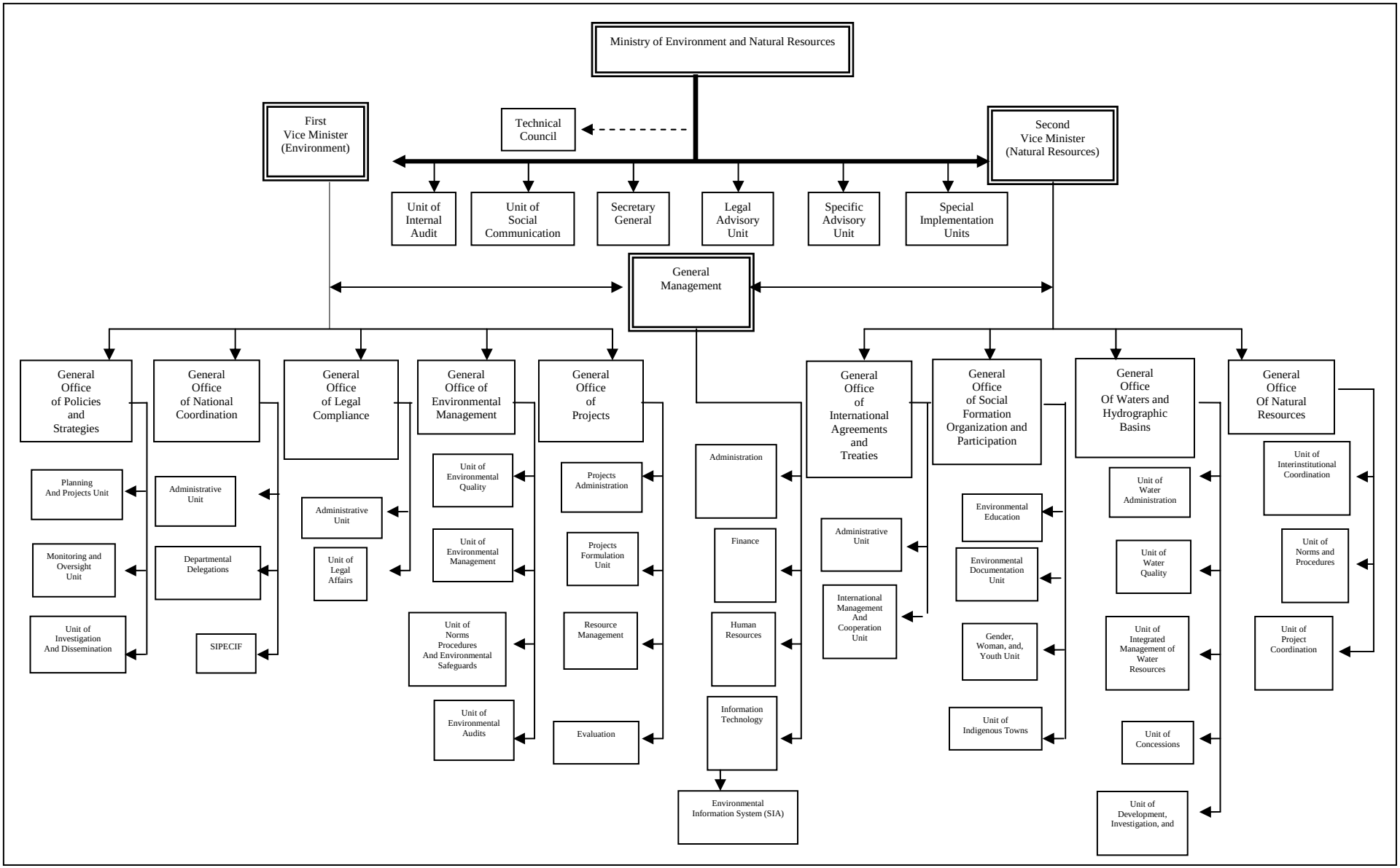


Table 6. Budgetary Allocations by Expenditure Type (2006)

Code	Description	2006 allocation (US$)	Percent of total
Total (A+B)		5,328,103	100
A. Operating costs		5,002,614	94
0	Personnel services	3,305,184	62
1	Non-personnel services	992,049	19
2	Materials and supplies	482,227	9
4	Current transfers	183,775	3
9	Global assignments	39,380	1
B. Investment		325,489	6
3	Property, plant, equipment, & intangibles	292,672	5
5	Capital transfers	32,817	1

Source: Ministry of Finance (MINFIN) and MARN

Given MARN's limited resources, it must ensure they are efficiently spent by establishing clear priorities and directing resources toward achieving measurable results that focus on addressing these environmental priorities. MARN must also ensure effective monitoring and oversight to ensure that priorities are achieved. MARN could negotiate larger budgetary allocations if its contribution to development goals (through environmental and natural resource management) became more clear. MARN also faces the challenge of improving its negotiation and coordination capacity to induce other government agencies to allocate resources to meet environmental policy goals.

2.1.4 MARN's Coordination with Other Public Organizations

MARN has to work with other organizations on environmental policies (Box 5). These organizations belong both to the executive power (CONAP, MAGA, INAB, MSPAS, MCIV) and to the legislative and judicial powers. Figure 3 indicates the need to find common interests among the principal actors at the political level (inter-ministerial), at the implementation level, and at the local level.

Executive Branch. Given the importance of sectoral policies (such as energy, agriculture, and infrastructure), integrating environmental considerations into sectoral policies is a key tenet of successful environmental policies. Despite worthy efforts (e.g., MCIV), there is still a long way to go to integrate environmental considerations into sectoral policies. In Guatemala there are various general coordination mechanisms available. Governmental cabinets represent the highest level of coordination bodies, and they have proved to be successful when: (i) ministers view the cabinet's Commissioner as an advisor rather than an immediate boss or a competing authority; (ii) there is a clear policy and defined agenda; (iii) working groups are deliberately formed to handle a topic in an integrated manner; (iv) there is financial backing signifying that when decisions are made they have a direct impact on the general budget of each participating ministry; and (v) there is a Technical Secretariat to oversee work plans, follow up, and accountability.

An Environmental Cabinet with these characteristics would facilitate the difficult task of coordinating all executive branch organizations that play important roles in environmental policy.

Coordination with Non-governmental Actors. MARN is regarded by Guatemalan society as an open organization. From its creation to its day-to-day practice, the Ministry has tried to compensate for its lack of economic and political resources with an openness to society, repeatedly encouraging direct contact with stakeholders. For instance, a strong cooperative relationship with the academic sector has been nurtured. Universities such as Rafael Landivar have provided the expertise to promote environmental initiatives and broker environmental agreements.

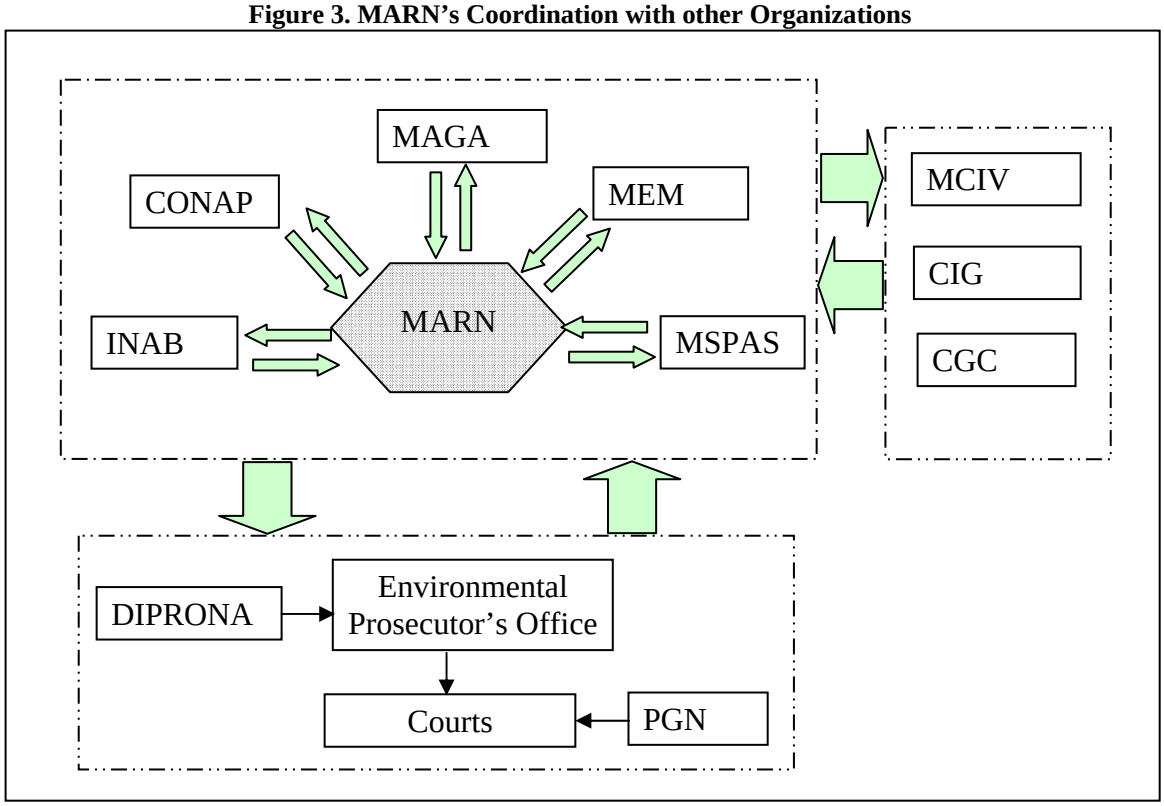
Furthermore, MARN has profited from dialogue with the large number of non-governmental organizations that work on environmental issues. Among these, a few institutions stand out as having the knowledge and critical ability to contribute to governmental policy by providing additional research, analysis, project management, and environmental education, including Environment and Natural Resource Institute at Rafael Landivar University (IARNA), Center for Conservation Studies at San Carlos University (CECON), Facultad Latinoamericana de Ciencias Sociales (FLACSO), IUCN, Defensores de la Naturaleza, Madre Selva, Fundacion Solar, Centro de Accion Legal, Social y Ambiental, Madre Selva, and Comite Coordinador de Asociaciones Agricolas, Comerciales, Industriales, y Financieras (CACIF).

Box 5. Legal Coordination Mechanisms

Guatemala relies on legal coordination mechanisms to formulate and implement policies. These coordination mechanisms include:

- **Presidential Commissioners.** The commissioners are responsible for overseeing specific governmental areas that are normally presided over by Ministers.
- **Governmental Cabinets.** According to the Constitution and the Executive Law these bodies are coordinated and convened by the Vice President of the Republic. They are convened when the Vice President deems it necessary and when a specific work agenda of national interest exists. The Environmental Cabinet has not been convened during the present administration, however, the legal mandate does exist for its formation.
- **Consultative Committees at the Ministerial level.** In MARN the Consultative Council is created by regulation, with the objective of coordinating stakeholders in the formulation of environmental policy.
- **Bilateral Agreements.** MARN has overseen the development of cooperation agreements and promoted strategic alliances within the sector to support the professional evaluation of EIAs.

Figure 3. MARN's Coordination with other Organizations



Most of these organizations carry out high-quality research and analysis and work on specific projects. They have played an important role in influencing the adoption of public policies in favor of the environment and raising environmental awareness among Guatemalans, and have been key in raising the level of the policy dialogue on environmental issues. A Consultative Council with legitimate public input could choose two or three NGO representatives for the council, establish effective mechanisms to set agendas, follow-up on agreements (even though they are non-binding), and report distribution could greatly facilitate coordination with academia, NGOs, and business organizations.

International Cooperation. Since its creation MARN has developed several initiatives and programs in collaboration with some international cooperation agencies. USAID through its Environmental Policies Institutional Strengthening Program (FIPA, in Spanish) has provided support, among other areas, for preparation of an institutional strategy and a framework policy for the environment and natural resources that can serve as a basis for other specific policies and regulations. The World Bank through the GEF has supported biodiversity and conservation projects. GTZ and the Dutch government have supported the decentralization process of environmental management that has also received continued support from the Danish International Development Agency (DANIDA) that is financing a program focused on water and solid waste. Also, the Dutch government has supported work to improve EIAs and to develop SEAs. GTZ and the Dutch programs have particularly supported the development of municipal environmental indicators (water and solid waste), the creation of an environmental information and risk management network in the eastern part of the country in cooperation with other donors

including IADB. GTZ has facilitated collaboration between Mexico's SEMARNAT and MARN, and support to MARN to carry out a Strategic Environmental Analysis. MARN has also benefited from a regional cooperation program with the Central American Commission for Environment and Development (CCAD, in Spanish) financed by the Netherlands, IUCN, Sweden, and IADB. IADB is preparing a project to strengthen MARN's institutional capacity, with special emphasis on EIAs, information systems, and enforcement.

2.2 Other Governmental Organizations

The governmental entity that has the closest relationship with MARN is the National Council of Protected Areas (CONAP), which develops and executes environmental conservation and protection action plans, particularly in the Guatemalan System of Protected Areas (SIGAP).[28] CONAP has excellent coordination with NGOs for the administration of certain protected areas. These organizations share similar philosophies with CONAP and many staff in both CONAP and NGOs have similar academic training (many are biologists).

CONAP was created by law and has a Council that includes these organizations and representatives:

- MARN, which presides over the Council
- Center for Conservationist Studies CECON/USAC
- National Institute of Anthropology and History (INAEH)
- A delegate from the non-governmental organizations
- National Institute of Municipal Promotion (INFOM)
- Guatemalan Tourism Institute (INGUAT)
- Ministry of Agriculture, Livestock, and Food (MAGA)

This Council discusses and assesses all policies that affect conservation interests and the protection of flora and fauna in danger of extinction and those treaties in the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). For implementation of its policies, CONAP relies on the Executive Secretary who is appointed by the President of the Republic.

There is a significant contradiction in CONAP's structure that hinders the coordination process within the environment sector, particularly with MARN. On one hand, CONAP reports directly to the Presidency, and that according to the legal framework is responsible for implementing policy decisions and leading SIGAP's technical and administrative activities. On the other, CONAP's Presidency by legal mandate is exercised by MARN Minister, and this is where policy decisions are made. Problems arise when interests and goals diverge between the agencies.

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28. To date, within SIGAP there are 157 protected areas comprising approximately 3,362,740 hectares, which represent approximately 30 percent of the country's total land area.

There are six other organizations with a regulatory and/or implementation role in the environment sector (Box 7). MEM for example focuses its efforts in three areas: mining, petroleum, and energy generation (thermal, hydro, and other sources). All of these activities can have significant environmental impacts. MEM, therefore, has an extremely important role, in which it should: (i) strengthen its capacity to plan the sector's growth taking environmental aspects into consideration; (ii) help develop regulations; (iii) monitor and oversee mitigation measures; and (iv) design a communication strategy to disseminate information on the social benefits brought about by sector activities, including its environmental protection actions.

The ministries listed in Box 6 possess more personnel and financial resources than MARN. They also have structured work plans and the capacity to implement projects and programs, particularly INAB. It is therefore essential that a coordination mechanism, like an Environmental Cabinet, be set up. Coordination would not only make spending more efficient but it could set government priorities, address gaps, contradictions, duplication, and other problems that hinder effective and efficient government management and protect the country's environment and natural resources.

Budgets Assigned to Governmental Entities. Sufficient resource allocations are essential for policy implementation. MARN's budget is quite limited. However, when the "environment-related" budgets of all government organizations are taken into account, the resulting amount (although small when compared to all the important environmental problems that the country faces) could go a long way toward addressing environmental policy priorities. Table 7 summarizes the budgets assigned to governmental entities with environmental responsibilities.

On average, in the last years US$ 30 million has been assigned to the environment sector each year. This highlights the fact it is necessary to make expenditures more efficient by investing in programs that address the country's priorities and involving decision makers responsible for monetary decisions, in this case the Ministry of Public Finance.

2.3 Organizations Responsible for the Administration of Justice

Despite some progress, the country's administration of justice is still weak. The environment sector is no exception, where the process for handling environmental crimes has had poor results. Currently, out of 1,000 potential cases, only nine environmental crime cases are awaiting judgment. This number is small given that it is difficult to prove an environmental crime, and the fines imposed are very small in comparison with the damages generated. The main agencies responsible for criminal justice administration for environmental charges or crimes include:

Division for Protection of Nature (DIPRONA). This is a division of the National Civil Police and has the job of patrolling and protecting the country's natural heritage. It has 13 departmental offices and one mobile unit in the urban center. DIPRONA has a far-reaching patrol plan that covers all protected areas in the department of Petén, with the primary purpose of crime prevention. It regularly works in coordination with CONAP,

INAB, and the Office of the Federal Prosecutor for environmental crimes in the Ministry of Public Affairs.

Box 6. Other Government Agencies with Environmental Functions

The main government agencies with environmental regulatory or implementation functions are:

Ministry of Agriculture, Livestock, and Food (MAGA). This is one of the ministries with the greatest role in the environment sector in accordance with the law of the Executive Branch. It is responsible for coordinating and managing policies and strategies for sustainable development in the agriculture, livestock, forestry, and fishing and aquaculture sectors. MAGA has two administrative units specifically related to environment: (i) the Geographic Planning and Risk Management Unit (UPGGR), which is a geographic information system (GIS) with very advanced instruments and 10 years of implementation experience, and (ii) the Fisheries Unit (UNIPESCA), the authority responsible for looking after compliance with the General Law of Fisheries and Aquaculture. There is also a person who services as advisor to the Vice Minister on issues of natural resources and environment.

Ministry of Energy and Mines (MEM). This ministry is responsible for matters related to the legal framework for production and distribution of energy and hydrocarbons and for the exploration and exploitation of mineral resources. It has an Environment Unit whose purpose is to advise on how to carry out environmental impact assessments and to supervise and provide any follow-up required on mitigation plans. MEM is in the process of finalizing an inter-ministerial cooperation agreement with MARN under which MEM will support MARN with staff capable of evaluating EIAs.

Ministry of Public Health and Social Assistance (MSPAS). Through the Department for Regulation of Health and Environment Programs[29], MSPAS carries out oversight, monitoring, and control activities in six areas: water quality, discharge of wastewater and sewage, municipal and medical solid wastes, pesticides and herbicides, cemeteries and funeral parlors, and tobacco advertising. Its role is tied closely to the formulation of technical norms for monitoring and it has 250 inspectors who are responsible for taking samples. The samples are analyzed by a laboratory in Guatemala City and appropriate actions are taken based on the results. There are very highly qualified staff members in the department, which has an internal policy of contracting professionals with the equivalent of a Master's degree. This department was part of the team that formulated the technical aspects of the Wastewater Regulation, which is in the process of being approved, providing the relevant technical norms and labs for analyzing samples.

National Forests Institute (INAB). INAB was created by the 1996 Forestry Law as an autonomous, decentralized state agency with legal standing, its own culture, and administrative independence. The administrative structure is composed of a Board of Directors and the Office of Administration. The Board of Directors is composed of (i) MAGA, which serves as chair, (ii) the Ministry of Public Finance, (iii) the National Association of Municipalities (ANAM), (iv) the National Central School of Agriculture, (v) unions of the Guatemala Chamber of Industry (CIG), (vi) universities that conduct forestry studies, and (vii) non-governmental organizations. The Office of Administration is responsible for implementing programs and projects in the forestry sector. Because of the nature of the entity, its specialty is implementing programs and/or projects that promote and regulate logging. Two important projects are currently underway:

- Municipal and Community Forestry Project (BOSCOM). Supports decentralization and the goal of creating municipal forestry offices. Currently there are 130 offices in the country's 332 municipalities.
- Forestry Incentive Program (PINFOR). Intended to provide economic incentives to populations living in forest areas. The idea is to offer payments to promote forest conservation and forestry. Funding for this program comes directly from the Ministry of Public Finance.

29. This is part of the Health Regulation, Oversight, and Control Department.

Table 7. Budgets of Organizations with Environmental Responsibilities, 2003–2006 (US$)

Organization	2003	%	2004	%	2005	%	2006	%
MARN	4,599,018	16	5,263,130	19	5,232,197	16	5,328,026	17
MAGA	3,082,749	11	2,839,680	10	5,397,519	17	4,640,315	15
MEM (related offices)	3,164,173	11	3,179,700	11	2,675,199	8	2,618,486	8
MSPAS (Department of Regulations for Health and Environment Programs)	2,771,146	10	2,764,977	10	1,523,966	5	588,355	2
CONAP	4,428,057	16	4,340,438	15	4,181,504	13	4,429,594	14
INAB	6,803,430	24	6,678,334	24	7,530,927	23	7,679,163	25
Integrated Water Basin Management[30]	3,099,327	11	3,095,288	11	5,664,088	18	5,772,019	19
Total	**27,947,899**	**100**	**28,161,545**	**100**	**32,205,400**	**100**	**31,055,957**	**100**

Source: Ministry of Finance (MINFIN), General Budget of Income and Expenses of the State, Department of Finance and Administration of some organizations

National Army. For environmental matters, the army is responsible for:

- Maintaining the territorial integrity of protected areas in border zones.
- Providing cooperation in cases of public disaster.
- Implementing and coordinating a special surveillance system in the boundary areas of the Maya Biosphere Reserve.
- Coordinating restoration efforts in the core zone of the Maya Biosphere Reserve as well as in the Multiple Use Zones and buffer areas.

Office of the Federal Prosecutor for Environmental Crimes, Ministry of Public Affairs.

- Conduct criminal prosecutions and direct investigation of crime in public lawsuits.
- Investigate crimes in public lawsuits and present them for prosecution before the courts.
- Carry out civil lawsuits in cases envisioned by the law, assisting those who want to take legal action for crimes subject to private lawsuits.
- Oversee the police and other government security forces in the investigation of criminal activities.
- Intervene in the investigation and criminal prosecution of all crimes whose legal jurisdiction falls under environment.

30. Executed by the authorities for the sustainable management of the Amatitlan and Atitlan lakes (both organizations were created by law and report to the President).

- Currently, the Federal Prosecutor's three main areas of activity are (i) environmental pollution, (ii) forest violations, and (iii) protected area violations in which it works in coordination with MARN, INAB, and CONAP.

Courts

The Courts of First Instance for Drug Activities and Environment are responsible for alleged cases of environmental crime. These are the newest courts in the justice system and they still have limited experience. Located throughout the country in the areas with the highest rate of these types of crimes, these courts mainly deal with drug-related cases since very few environmental crimes have been admitted for prosecution.

These organizations have a clear understanding of their responsibilities to protect the environment, but they lack the resources required to perform adequately. For example, the Federal Prosecutor for the Environment has a staff of only four prosecutors and four technical experts that cover all of the country's departments with the exception of Izabal and Petén. Additionally, as previously discussed, the government needs to evaluate its enforcement strategy in order to rely more on compliance promotion combined with credible sanctions and a track record of enforcement. This may be more effective in fostering compliance and enforcement than relying solely on criminal prosecution.

2.4 Municipalities and Urban and Rural Development Councils

In Guatemala, municipalities are autonomous in accordance with the Constitution, electing their own officials, obtaining and disposing of their own resources, and attending to local public services (water, electricity, solid waste management, and transport). Political decisions are made in the Municipal Council and the municipal mayor is entrusted with fulfilling them. According to the Municipal Code, municipalities are responsible for administering and sustainably managing natural resources in their jurisdiction. Within municipalities, territorial planning is carried out by Planning Units. These Units are then coordinated by SEGEPLAN, which is currently conducting an environmental planning pilot in the departments of San Marcos and Sololá.

According to the Constitution, municipalities receive 10 percent of their resources from taxes. These funds are earmarked by law, with 90 percent directed to investments in infrastructure and 10 percent for operating costs.

Municipalities rely on advisory support from the Municipal Development Institute (INFOM). This institution promotes municipal progress by providing technical, financial, and administrative assistance to municipalities to support their implementation of basic public works and services programs, the organization of the Municipal Finance and Administration Office, and, in general, the development of municipal economies.

In addition, Urban and Rural Development Councils have been created in response to needs arising in the country's urban and rural areas, and are coordinated by the Executive Secretariat of the Presidency. These Councils are described in Box 7, however, in practice only the departmental, municipal and community councils are fully operational.

These development councils currently receive funding from 1% of national taxes (previously received from Community Solidarity Fund (FSC)). However, given the council members' lack of knowledge on environmental issues, these resources are rarely executed for activities in this sector.

3. Institutional and Organizational Strengths and Weaknesses

Environmental institutions and organizations face an enormous challenge. The country's strengths in meeting this challenge include:

- The Constitution clearly establishes the need to protect and use the environment and natural resources in a sustainable manner.
- There is an environmental legal framework that has been improved over time and that continues to evolve.
- MARN has a clear mandate to lead the sector by proposing environmental policies and programs and coordinating their implementation.
- MARN has shown willingness and capacity to improve its performance. EIA improvements and general efficiency measures are two clear examples.
- There is awareness of the importance of environmental and natural resource conservation and protection.
- The inter-sectoral responsibility for the environment has already led to MEM and MCIV establishing Environmental Units that include environmental and natural resource specialists as well as engineers. INFOM is also in the process of creating an environmental unit to advise municipalities in the preparation of EIAs.

Box 7. Urban and Rural Development Councils

The System of Urban and Rural Development Councils was created in 2002[31] with the objective of organizing public administration via the formulation of development policies, plans, and budgetary programs and promoting inter-institutional coordination. This system is represented at the following levels:

National, with the National Urban and Rural Development Council (CONADUR). Presided over by the President of the Republic, with the principal responsibility to formulate urban, rural development, and territorial planning policies.

Regional, with the Regional Urban and Rural Development Councils (COREDUR). Presided over by a regional coordinator who is named by the President, with the responsibility to promote, facilitate, and support the system, particularly the Departmental Development Councils of the region.

Departmental, with the Departmental Urban and Rural Development Councils (CODEDE). Presided over by the Governor of the Department, with the responsibility to support departmental municipalities in the functioning of the Development Councils.

Municipal, with the Municipal Urban and Rural Development Councils (COMUDES). Presided over by the Municipal Mayor, with the responsibility to promote, facilitate, and support the functioning of Community Councils.

Community, with the Community Urban and Rural Development Councils (COCODES). Presided over by a coordination body comprised of members according to the Council's own principles, values, norms, and internal procedures.

31. Law of Urban and Rural Development Councils, Decree No. 11-2002

Given that Guatemala is part of the DR-CAFTA, it must strengthen all organizations with a role in the sector.

In contrast, the following are the greatest weaknesses:

- Lack of an environmental policy with priorities and instruments to coordinate its implementation.
- The general structure of principal government organizations duplicates functions and presents unclear chains of command, particularly in the area of natural resources.
- Gaps, contradictions, and overlaps in the legal framework, particularly with sectoral laws (to manage water resources and air quality).
- The EIA is the only environmental management instrument that has been employed to date, and there has been oversight of environmental management plans.
- Lack of an information system to support policy definition and disclose data on environmental quality, thereby increasing citizen involvement.
- The current spirit of the regulatory framework treats environmental infractions as a crime rather than promoting or providing incentives for compliance. The framework is also ambitious in comparison with the capacity of those institutions responsible for its implementation.
- Public participation is scarce and clear mechanisms to promote participation are lacking.

Section VI provides recommendations to address these weaknesses.

IV. Trade and the Environment in Guatemala

In the recent past Guatemala has made significant progress in its degree of trade liberalization, promotion and diversification of exports, and conducting international negotiations. Signing DR-CAFTA and application of rules established by the WTO were also important advances. Total exports of goods and services increased at an annual rate of around 10 percent during the last decade, reaching a value of US$ 3,430 million in 2004, while imports increased at a rate of 4.5 percent in 2004 at US$ 7,812 million.[32] In addition to traditional exports such as coffee, bananas, sugar and cardamom, Guatemala also witnessed particularly dynamic non-traditional exports to the rest of the world and Central America. Imports of consumer goods, capital goods, raw materials, and fuel and lubricants increased considerably.

Ratification of the free trade agreement with the United States (DR-CAFTA) will help Guatemala secure broad and stable market access to its main trading partner and provide an anchor to implement growth-oriented institutional reforms. Such reforms should help attract new private investment and strengthen the position of traded goods as Guatemala faces growing international competition, including from the recent expiration of quotas on world trade in textiles. The increasing importance of international trade poses challenges from global and competitive markets, which also demand a sophisticated technical capacity to administer complex trade disciplines. In order to face these challenges, Guatemala needs to strengthen the institutions that manage its international trade.

One aspect of trade liberalization is calls to improve environmental standards, not only to protect natural assets and public health, but also to assure importers and investors concerned about corporate responsibility, particularly for the future development of the industrial and agricultural sectors. In discussions about DR-CAFTA's effects, the importance of the environment and natural resources has been emphasized (Box 8).

The increasing prospect of integration with the U.S. and the rest of the world should clearly set the necessary preconditions for an environmentally conscious private sector. The Government should take this opportunity to develop corporate guidelines as a part of an overall regulatory framework that recognizes environmental management as among the key corporate priorities and a determinant to sustainable development. This will not only promote better local environmental conditions, but also facilitate faster integration with the rest of the world. Voluntary approaches that go beyond compliance with government regulatory requirements can be used to make businesses increasingly accountable for their actions

Adopting cleaner environmental techniques and conditions will likely yield several benefits. More and more, enterprises trading in an increasingly competitive global market feel that their reputation can be enhanced by creating a socially and environmentally responsible image.

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32. IMF (2005)

Box 8. Environmental Provisions of DR-CAFTA

DR-CAFTA contains a number of environmental provisions, including measures that empower citizens to enforce environmental laws and create mechanisms to improve environmental protection.

Article 17.7 of DR-CAFTA creates a citizen submission process that allows any citizen of a DR-CAFTA member country to file a complaint alleging that a country is not enforcing its environmental laws. The procedure requires parties to respond to citizen allegations and provides for an environmental secretariat to develop a factual record about the allegation. These citizen submission procedures are similar to those found in the North American Free Trade Agreement (NAFTA) environmental side agreement.

A section on voluntary mechanisms to enhance environmental performance requires parties to encourage voluntary performance guidelines, information sharing, and development of incentives such as market-based programs to encourage conservation and protection of the environment.

An environmental cooperation agreement provides a framework to build environmental capacity in DR-CAFTA countries and establishes an Environmental Cooperation Commission.

An explicit recognition of multilateral environmental agreements requires parties to enhance the mutual supportiveness of trade agreements and environmental agreements.

1. Trade and Environment Debate

Environmentalists and the trade policy community have been engaged in a heated debate over the last decade or so over the environmental consequences of liberalized trade. It loomed large in NAFTA. This debate intensified with the creation of the World Trade Organization (WTO) and the subsequent Doha round of trade negotiations, and was initially quite contentious and unproductive because the parties differed greatly in their trust of market forces, and typically value the environment differently (Copeland and Taylor, 2004). Free traders feared that environmental protection would be used as an excuse by some economic sectors to gain protection against competition from abroad. Environmentalists feared that free trade would be used as an excuse to give inadequate weight to environmental goals and excessive weight to maximizing market-measured GDP. The importance of establishing coherent relationships between the trade obligations set out in various bilateral/multilateral trade agreements and environmental policies of countries is increasingly being recognized.[33]

Concerns about environmental implications of trade involve both the domestic implications of policy reforms and the global environmental dimension of bilateral and multilateral trade agreements. Although liberalizing reforms generally promotes more efficient resource use (including use of environmental resources), in practice there is no clear-cut reason to expect that trade liberalization will be either good or bad for the environment. Nonetheless, some of the common concerns often highlighted (by the environmentalists) are:

33. A number of bilateral agreements have gone beyond WTO to give attention to environmental protection aspects. Agreements such as NAFTA and the U.S.-Singapore FTA directly address environmental concerns, and regional economic integration organizations (for example, MERCOSUR) deal with trade-environment issues in relations among their members and in global policy activities. A number of countries that recently joined the European Union (EU) and the ones that are aspiring to join have to meet certain clear-cut environmental policy requirements.

- *Trade may cause environmental harm by promoting economic growth.* Growth without environmental safeguards in place results in unsustainable consumption of natural resources and waste production.
- *Trade* rules and trade liberalization often entail market access agreements that can be used to override environmental regulations, unless appropriate environmental protection measures are built into the structure of the trading system.
- *Reducing* barriers to trade will reinforce the tendency of countries to export commodities that make use of resource-intensive production factors. As a result of weak environmental policies, trade liberalization in developing countries may shift the composition of production, exports, and FDI to more pollution- or resource-intensive sectors.
- Trade *liberalization* may directly affect environmental standards. Intensified competition could lead to a "race to the bottom" because governments in countries with higher standards may lower standards in the hope of giving domestic firms a competitive edge in world markets or attracting foreign investment.
- "*Environmental* tariffs" may be employed against trading partners deemed to have inadequate environmental standards, risking their use as disguised protection for domestic firms.

In practice, however, the opposite often seems to be the case. Trade liberalization agreements also usually call for improved environmental standards, not only to protect natural assets and public health, but also to assure foreign importers and investors concerned about corporate responsibility, particularly for future development of the industrial and agricultural sectors. In discussions about DR-CAFTA, much emphasis has been placed on the importance of the environment and natural resources.

Further, more open trade often improves growth and economic welfare and in itself could take some pressure off the environment by making more resources available for environmental protection. Increased real income is also often associated with increased demand for environmental quality. Countries that are more open to trade seem to adopt cleaner technologies more quickly (WTO, 2004). Greater openness to trade also encourages cleaner manufacturing because protectionist countries tend to shelter pollution-intensive heavy industries (World Bank, 2000). Often, however, pressure on the environment and natural resources — incentives to overexploit or deplete resources — are more directly related to policies and institutions within the sector than to trade openness per se (World Bank, 1999).

2. Overview of the Literature

In general, trade liberalization can affect the environment through several mechanisms such as inter-jurisdictional competition to lower standards, transfer of pollution abatement technology, cross-border spillovers, or changes to the overall scale of economies. The various effects of trade on environmental quality can be divided into three components: how trade affects the overall *scale* of the economy, how trade affects the *techniques* of production, and how trade affects the *composition* of industries (Copeland and Taylor, 2004).

The empirical literature on the relationship between trade and the environment so far has found quite varying results. The studies fall into three distinct categories. First are those that are primarily concerned with growth and pollution levels and that interpret their results as indicative of the relative strength of scale versus technique effects (for example, Grossman and Krueger [1993, 1995]; Shafik [1994]; Seldon and Song [1994]; and Hettige, Mani, and Wheeler [1996]). These often go under the rubric of "Environmental Kuznets Curve" literature.

There are also studies that examine how trade flows may themselves be affected by the level of abatement costs or strictness of pollution regulation in the trading partner countries. This approach was employed in the context of the NAFTA agreement by Grossman and Krueger (1993), and for a large cross-section of countries by Antweiler (1996) and Mani and Wheeler (1998). There are other studies that employ the U.S. or other country intensities to infer how changes in production and trade flows have altered the pollution intensity of production in both developed and developing countries (Low and Yates, 1992; Dean, 2002).

Other related studies suggest that economic liberalization and currency devaluations tend to yield higher agricultural and timber prices that, in general, will promote deforestation (Angelsen and Kaimowitz, 1999). Several other studies (Panayotou, 1993; Cropper and Griffiths, 1994; and Rock, 1996) have tried to estimate the existence of an environmental curve for deforestation; that is, at low income levels an increase in income will accelerate the rate of deforestation, but higher income beyond a certain level reduces deforestation. But the levels of per capita income they estimate must be reached before deforestation declines vary considerably. Moreover, higher incomes within the relevant range of income often found in developing countries, are likely to increase the pressure on forest resources (Angelson and Kaimowitz, 1999). On the hand, Barbier (2002) argues that a key factor influencing deforestation is the lack of effective property rights and other institutional structures controlling access to and use of forests. Using data from Mexico during the pre-NAFTA period, he argues that the existence of *ejido*, or communal land ownership, for the vast majority of forest land — implying strong institutional controls — may have restricted the rate of adjustment in the amount of new land converted and thus limited agricultural expansion. The analysis has implications for the post-NAFTA period which included changes in the traditional *ejido* land ownership structure.

Overall, the results from these studies are best described as mixed. Apart from specific case studies, there is very little evidence linking liberalized trade in general with

significant changes in the environment. In addition, there is little evidence that differences in abatement costs are a significant determinant of trade flows. There is, however, evidence that increases in income will, after a point, lead to lower concentrations of some pollutants, but the role that trade plays in this process is not clear. Finally, there is some evidence that the composition of exports from some developing countries have become dirtier over time.

Nonetheless, given Guatemala's comparative advantage in labor-intensive goods and relatively weaker environmental regulations compared to its main trading partners (such as the United States and EU), there is concern that as Guatemala continues to expand its international trade it may be specializing in resource-intensive industries. Also, the shift from a traditional agro-based economy to a manufacturing economy may shift the pressure from rural to urban areas.

The primary objective of this chapter is to examine the composition effect of trade liberalization in Guatemala and to formulate policy recommendations for its trade and environmental policies.[34] A retrospective analysis of Guatemala's experience with partial trade liberalization (as a result of its participation in the free trade agreements) in the past few years will enable us to provide policy recommendations to reduce potential negative environmental effects as DR-CAFTA takes effect this year.

3. Trading Patterns and Implications for the Environment

While the economic importance of traditional exports has been declining (coffee, bananas, sugar, cardamom, etc.), the sector continues to exert considerable influence in terms of its contribution to value-added and employment. The share of the non-traditional sector, on the other hand, has increased significantly, rising from 62 percent of total exports in 1999 to 71 percent in 2004 (Table 8). The *maquila* industry especially has become a major contributor to exports and foreign exchange earnings. This is mainly due to the expansion of the industries operating under special regimes such as free trade zones, and to outward processing warehouses.

The rather modest export performance in Guatemala can be attributable to significant differences in the dynamics of three different sectors. The *maquila* sector has shown impressive growth since 1990 with net exports increasing steadily as a result of US trade preferences and the success of the free trade zone regimes in attracting FDI.[35] The traditional export products (e.g., coffee, bananas, sugar, and cardamom) on the other hand have seen trade volumes fall steadily during the 1990s as a consequence of slow demand growth and low commodity prices. Non-traditional exports (e.g., flowers, seasonal vegetables, fruits, and organic crops) grew dynamically until 2000 but have stagnated

34. Composition effect measures the increase in pollution that is likely to result due to a change in the composition of output and exports following a move toward free trade.

35. The Guatemala *maquila* sector is distinguished in Central America for its emphasis on delivering the so-called "full package", in which textile producers are responsible for most phases of production. This ability fosters a competitive edge based on service delivery rather than solely on low labor costs (World Bank, 2005).

since due to lower growth in the international economy. Despite these mixed trends, rapid growth of non-traditional exports in recent years has made Guatemala into one of the most diversified exporters in Central America (Box 9).

Table 8. Guatemalan Exports of Principal Commodities (millions of US$)

Category	1999	2000	2001	2002	2003	2004
Total exports	**2,781**	**3,085**	**2,860**	**2,819**	**3,060**	**3,430**
Traditional exports	1,056	1,178	950	958	971	1,004
Non-traditional exports	1,725	1,907	1,910	1,861	2,089	2,426
Coffee	588	572	301	269	292	326
Bananas	143	188	193	233	233	234
Sugar	188	180	260	208	189	191
Cardamom	56	79	96	93	79	74
Petroleum	81	159	100	155	177	179
Other exports	1,725	1,907	1,910	1,861	2,089	2,426
Of which: *maquila*	288	374	396	346	428	491
Share of total exports (%)						
Traditional	38.0	38.2	33.2	34.0	31.7	29.3
Of which: *coffee*	21.1	18.5	10.5	9.5	9.6	9.5
Non-traditional	62.0	61.8	66.8	66.0	68.3	70.7

Source: Bank of Guatemala

Box 9. Snow Peas and Growing Non-Traditional Exports in Guatemala

Non-traditional agro-exports have been the most dynamic element within Guatemala's agricultural export economy for the past two decades and a major contributor to economic growth since 1990s. Non-traditional products like snow peas, broccoli, melons, and berries have been widely lauded for giving small farmers high-return export opportunities (and thereby lifting them out of poverty) and for providing an alternative to employment in the coffee sector in the context of the sharp deterioration of international coffee prices.

Snow pea production in Guatemala increased almost ten-fold from 3.7 million pounds in 1986 to 36.1 million pounds by the mid-1990s, making it the most important non-traditional export. In 2001 snow pea exports were worth US$ 12.4 million, providing 28 percent of the country's vegetable export earnings, with almost all sales going to the United States. Between 1997 and 2001 Guatemala was responsible for 16.8 percent of snow pea exports from the developing world, making it the leading exporter along with Zimbabwe. An interesting aspect is that much of the snow pea production is in the hands of 18,000-20,000 relatively small-scale, mainly indigenous Mayan farmers in the highlands, usually on plots of under 2 hectares.

Source: Krznaric, 2005

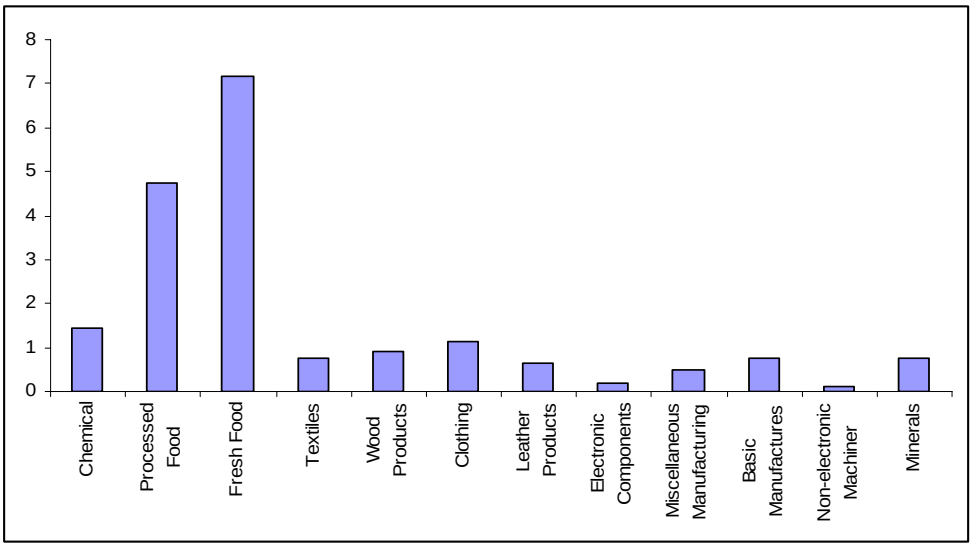
In general, more open trade improves growth and economic welfare. This in itself could take some pressure off the environment by making more resources available for

environmental protection. On the other hand, increased trade and growth without appropriate environmental policies in place may have unwanted effects on the environment. To understand the net effects it is useful to break up the effects into scale, composition, and technique effects.

The *scale* effect means that more open trade creates greater economic activity, thus raising the demand for inputs such as raw materials, transportation services, and energy. The *composition* effect stems from changes in the relative size of the economic sectors following a reduction in trade barriers. Countries tend to specialize production in sectors for which they have a comparative advantage, and this tendency becomes more pronounced with freer trade. The *technique* effect refers to changes in production methods that follow trade liberalization. Since trade liberalization generates increased income levels, demand for environmental quality is also likely to increase. The net impact of trade liberalization will thus depend on which one of these effects will dominate.

At the outset, if we look at the share of industries dominating export sectors in Guatemala using the Balassa index,[36] food products (both fresh and processed), chemicals, and textiles dominate as indicated by revealed comparative advantage (Fig. 5). Hence the environmental and resource implications of "composition effect" might not be small.

Figure 4. Guatemala's Revealed Comparative Advantage



Source: WTO International Trade Center

In terms of the scale effect, there has been a steady increase in the volume of exports since 2000 (except for a small dip in 2002), although there has not been an overtly expansionary trend. Two sectors where this trend is slightly more pronounced are food

36. The Balassa index measures the country's revealed comparative advantage in exports according to the Balassa formula. The index compares the share of a given sector in national exports with the share of this sector in world exports.

processing (food and live animals) and chemicals and manufacturing (Fig. 6). Food and food processing operations dwarf all other exports in Guatemala and can be responsible for producing considerable waste in a variety of forms such as wastewater, solid waste, and air emissions. In the absence of adequate controls, these could become a serious threat to human health and the environment (Box 10). The manufacturing base is expanding gradually, especially in the *maquila* sector, which in the absence of adequate controls, could accentuate existing environmental problems.

Guatemala continues to be a major importer of heavy machinery and equipment, chemicals, and manufactured goods (Fig. 7). This reflects an increasing transformation from a traditional economy to a modern process-oriented economy. The environmental implications of this could be high if it also involves import of cheaper pollution-intensive technologies.

Another way to look at trade performance is to see if there will be a trade-induced shift toward cleaner or dirtier production as a result of DR-CAFTA. A recent Bank study attempted to quantify the potential effects of the elimination of U.S. tariffs on Guatemalan exports. These effects were computed using partial equilibrium simulations that were based on market-specific elasticities.

The simulations suggest that trade gains from DR-CAFTA would amount to a short-term increase in exports of 47 percent (US$ 778 million), compared to their 2001 level. The study estimates that most of the gains would be concentrated in the apparel sector, assuming no significant capacity constraints (Table 9). As for the other countries in the region, the greatest potential for expanded Guatemala apparel exports lies in a loosening of current rules of origin.[37] For non-apparel manufactured goods, the analysis does not reveal significant gains aside from *maquila* products. It should be noted that these simulations often underestimate the supply response because they cannot anticipate new exports aside from those for which exports already exist.

Industries are often identified as “clean” or “dirty” depending on their pollution intensity or level of abatement expenditures. By using either criterion, some of the most polluting sectors to emerge are iron and steel, non-ferrous metals, industrial chemicals, pulp and paper, and non-metallic mineral products. The dirtiest manufacturing industries, using either approach, appear to be fairly stable across countries and pollutants. These industries also tend to be highly capital-intensive, energy-intensive, and land-intensive.

37. Hopes for expanded apparel exports from the region in general face significant uncertainties given that all textile quotas among WTO members will be eliminated at the end of MFA. It is expected that China with its strong absolute comparative advantage may sharply increase its exports to the U.S. market to the detriment of higher cost participants. But even under a complete elimination of quantitative restrictions on apparel trade, Guatemala (and other Central American countries) is likely to continue to enjoy a significant tariff advantage over Asian competitors. In addition, Guatemala would continue to benefit from its proximity to the U.S. market. The specialization on “full package” services by its apparel exporting firms should create significant opportunities for development of local links for this cluster beyond the pure assembly model associated with *maquila* (World Bank, 2005).

Box 10. Water Use and Pollution from Food Processing

Food processing can be divided into four major sectors: fruits and vegetables; meat, poultry, and seafood; beverages and bottling; and dairy operations. All sectors consume huge amounts of water for processing. A considerable part of this water is potential wastewater that needs to be treated for safe disposal. Typical rates of water use for various food-processing sectors are shown below. An abundant and inexpensive water source is a requirement for the food processing industry, as well as for farming.

Commodity	Range of flow (gallons/ton of product)
Fruits and vegetables	
Green beans	12,000–17,000
Peaches and pears	3,600–4,800
Other fruits and vegetables	960–8,400
Food and beverage	
Beer	2,400–3,840
Bread	480–960
Meat packing	3,600–4,800
Milk products	2,400–4,800

Wastewater and solid waste are the primary area of pollution control within the fruit and vegetable food processing industry. Their wastewater is high in suspended solids and organic sugars and starches, and may contain residual pesticides. Solid waste includes organic materials from mechanical preparation processes such as rinds, seeds, and skins from raw materials. For the most part, solid waste that is not resold as animal feed is handled by conventional biological treatment, or composting. Meat, poultry, and seafood facilities offer a more difficult waste stream to treat. The killing and rendering processes create blood by-products and waste streams that are extremely high in biological oxygen demand (BOD). These facilities are very prone to disease spread by pathogenic organisms carried and transmitted by livestock, poultry, and seafood. Wastewater and solid waste are the primary waste streams for the beverage and fermentation sector. Solid waste is spent grains and materials used in the fermentation process.

Source: United Nations Industrial Development Organization

Figure 5. Sectoral Trend in Guatemala's Exports, 2000–2004 ('000 US$)

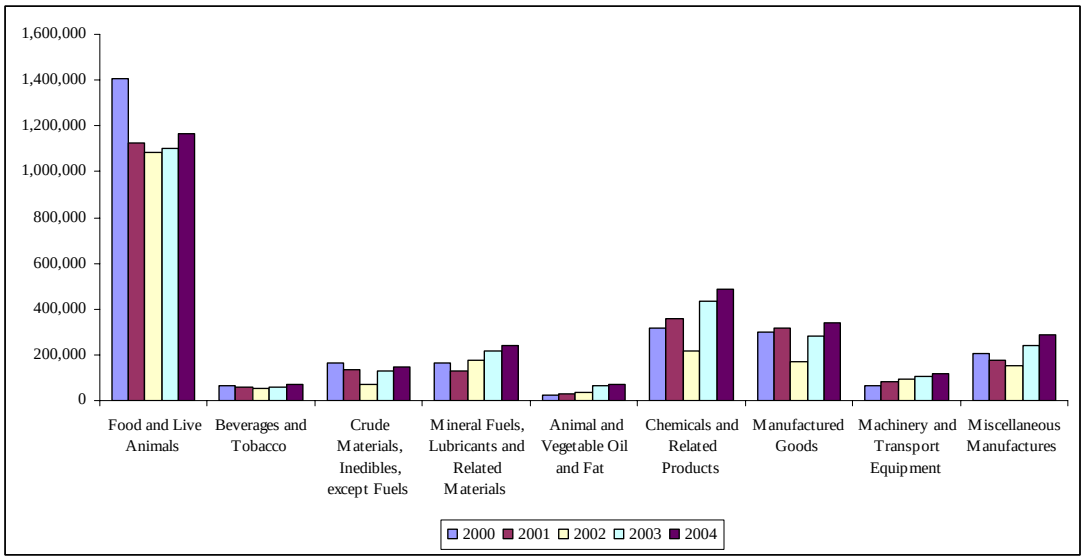


Figure 6. Sectoral Trend in Guatemala's Imports, 2000–2004 ('000 US$)

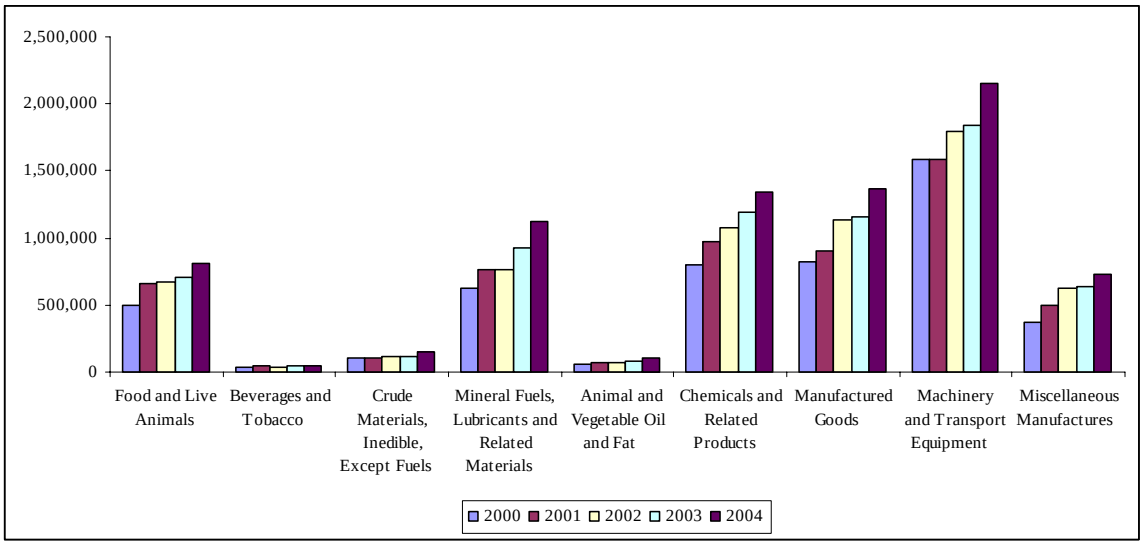


Table 9. Estimated Effects of U.S. Tariff Elimination on Key Sectors from DR-CAFTA

Sector	Percentage change
Apparel (knitted)	58.4
Tobacco	57.1
Footwear	42.0
Man-made filaments	34.4
Apparel (not knitted)	34.3
Articles of leather	32.7
Manmade fibres	31.4
Textiles	25.3
Cotton	21.8
Wool	21.1
Special fabrics/tapestry	18.5

Source: World Bank

By this logic the apparel and textile sectors are often not considered as the most polluting (at least from a developed country perspective) because of their assembly nature and high labor intensity. However, in the developing country context, textiles and leather are among two of the most polluting industries, and within these industries, producing cloth and tanning leather are the most polluting processes. Garment industries with their backward-linked sectors such composite textile mills (including dyeing, printing, and finishing units) and leather processing units use substantial quantities of highly toxic dyes and chemicals. These effluents are often untreated before they are discharged to surface water. The increasing use of chemicals in textiles and other manufacturing areas could also pose serious health risks to workers in the absence of protection from chemicals and other pollutants inside factories.

Tanneries and some textile finishing units situated in land-locked areas could also pose increasing pollution problems. Tanneries generate effluents that are typically high in organic and inorganic pollutants. Environmental and health impacts could be quite significant. The environmental implications of increasing tobacco and cotton production often go unnoticed. In a number of countries a boost in exports is also associated with increasing rates of deforestation (discussed later).

Overall, evidence suggests that Guatemala could face increasing environmental challenges as the economy expands from the opportunities offered by DR-CAFTA. In the absence of adequate regulation and enforcement there is a serious danger that environmental costs could far outweigh the economic benefits.

3.1 Technical Barriers

The efforts to expand Guatemala's trade in both traditional and non-traditional areas could face serious challenges from the very stringent and always changing international environmental requirements (including food safety and health requirements often referred to as Sanitary and Phytosanitary measures [SPS]) (Box 11). Compliance with these

requirements is an important prerequisite for Guatemala's export competitiveness. Even though environmental requirements (to meet developed country standards) are often viewed as an hurdle in a developing country context, complying with them can be an opportunity not only because compliance would ensure more exports would enter the world market, but there is evidence to suggest that compliance with international requirements helps to accelerate improvements in food safety, occupational safety, and health, as well as air and water pollution standards at the national level.

Box 11. Sanitary and Phytosanitary Measures (SPS)

The Sanitary and Phytosanitary (SPS) Agreement establishes a multilateral mechanism to protect human, animal, and plant health in World Trade Organization (WTO) member countries. As a WTO member, this Agreement protects exporters from use of health−related measures to disguise barriers to trade by other countries.

In the context of the Agreement, SPS measures refer to any measure, procedure, requirement, or regulation taken by governments to protect human, animal, or plant life or health from risks arising from the spread of pests, diseases, disease−causing organisms, or from additives, toxins, or contaminants found in food, beverages, or feedstuffs.

The impact of specific SPS measures can be expected to depend on the safety level or quality standard specified as well as the form of its regulatory mechanism (such as product, process, or performance standards). The food industry is especially vulnerable to SPS standards and countries will need to address the SPS more carefully and make significant changes in production and distribution methods in order to gain wider access to world markets.

Guatemala's major exports are food products, thus it faces increasing challenges to comply with the U.S. Food, Drug, and Cosmetic Act which authorizes FDA to detain a regulated product. As seen Table 10, among the Central American countries, Guatemala has had the highest refusal rate for violating the Act during the last six months.

DR-CAFTA also includes an understanding that implementation of existing obligations under the WTO SPS Agreement will be a shared objective. It further supports establishment of an SPS committee to help each party to implement the WTO SPS Agreement.

The biggest challenge facing Guatemala, however, is lack of capacity both in the public and private sectors to comply with these requirements and undertake the necessary conformity checks to ensure that compliance has been achieved. This is also confirmed by a recent USDA study that also identified insufficient technical expertise as a major constraint in terms of complying with SPS requirements. This includes an insufficient number of trained specialists for pest diagnosis, laboratory support staff, laboratory managers, and inspection service personnel. While there is legislation that provides for compliance with the SPS Agreement and gives appropriate authority to the national organization, inspection and diagnostics are often laking because of the shortage of trained personnel. This is further exacerbated by lack of awareness, little coordination among the relevant institutions, and little or no participation in the process of setting standards/requirements for key exports.

DR-CAFTA also would especially pose challenges to small-scale producers and their ability to meet many sanitary measures. Gaining access especially to U.S. markets not only requires proper documentation of the entire production process, but also specific obligations about the use of fertilizers and pesticides, registration of foods and veterinary and biological medicines, and specific sanitary standards and certificates (Box 12).

Table 10. U.S. FDA's Import Refusal Rate (October 2005–March 2006)

Country	Oct 2005	Nov 2005	Dec 2005	Jan 2006	Feb 2006	Mar 2006	Total
Costa Rica	5	4	2	1	4	1	17
El Salvador	10	19	8	5	3	4	49
Guatemala	39	87	69	7	17	37	256
Honduras	6	1	2	1	1	7	18
Nicaragua	9	2	8	3	1	0	23

Source: U.S. Food and Drug Administration

Box 12. Increasing Barriers to Small-Scale Producers

During the first decade of snow pea production — one of Guatemala's top non-traditional exports — ever-increasing amounts of pesticide were used to ensure high yields. In the 1990s, increasing concern over harmful pesticides prompted the U.S. Food and Drug Administration to increase monitoring of food imports. Guatemalan snow peas were found to be the most serious violator, breaching U.S. regulations on pesticide levels. Between 1995 and 1996, for instance, Guatemalan snow pea exports dropped over 25 percent, with a disproportionate impact on the smallest producers, who tended to use more pesticides. It also prompted some export companies to work with large-scale farmers who were in a better position to introduce strict production controls and thus meet U.S. requirements.

Source: Krznaric (2005)

Although there is some transition assistance being provided, Guatemala will need to create policies and programs that will help producers meet export/import requirements and strengthen national systems to meet standards of the U.S. market.

4. Foreign Direct Investment

Foreign direct investment has been steadily increasing in Guatemala although it remains much lower than in other countries in the region. Inward FDI has increased from about US$ 2 billion in the early 1990s to about US$ 4.5 billion in 2005. Much of the initial FDI in Guatemala was concentrated largely in the manufacturing, petroleum, and finance sectors due to gradual liberalization of foreign investment laws. More recently, however, the rapid growth of the *maquila* sector could be attributed to the success of the free trade zones in attracting FDI.

DR-CAFTA is also expected to encourage investment, including FDI, although the magnitude of such flows and their implications for the environment are difficult to anticipate. Investors are likely to be attracted by the new profit opportunities brought about by DR-CAFTA, and more significantly by the credibility effect (or reduced risk)

that the agreement is likely to introduce. However, a recent Bank study identified crime and violence, corruption, trade and customs regulations, tax administration, and business licensing as continuing major impediments to attracting foreign investment (Box 13).

Box 13. Guatemalan Investment Climate

One of the factors contributing to the lackluster performance of the Guatemalan economy during the last few years is its deteriorating business climate. Increasing levels of violence and crime, corruption, and a confrontational attitude by the Government toward the private sector has discouraged many private activities. In fact, preliminary estimates for Guatemala indicate that the cost of corruption, crime, poor regulation, and losses through disruptions in infrastructure cumulatively add up to approximately 15 percent of sales, much higher than in neighboring Honduras (12.9 percent) and Nicaragua (13.3 percent). In addition to the negative impact of these costs on the performance of existing enterprises, they also have implications for new investors, especially small- and medium-sized investors with limited resources and export-oriented firms that could locate to competitor nations with more conducive investment climates.

Source: World Bank (2005).

From a corporate point of view, there are likely to be several benefits to adopting cleaner environmental techniques and conditions. Better environmental performance is often seen as synonymous with improved quality of final products, improved operating efficiency with less resource use and less waste, all leading to increased profitability. Having transparent and consistent regulatory structures for environmental protection are seen as a precondition for making informed investment decisions and attracting reputable, strategic investors. The Government of Guatemala could use this opportunity to create the right incentives to conduct operations in an environmentally sound manner.

Recent efforts to encourage foreign investment in the sub-surface mineral and petroleum sector while ensuring modern standards of environmental protection are to be welcomed. There is a need, however, to ensure that there is a supporting policy and regulatory framework that encourages an environmentally sustainable and socially responsible extractive sector.

4.1 Implications for Frontier Expansion

Guatemala could significantly increase its agricultural exports to the U.S. as some of the barriers are eliminated under DR-CAFTA.[38] According to a recent Bank study, there are a number of areas where opportunities exist for large increases in farm income in high-value coffee, horticulture products, and livestock. A significant component of Guatemala's strategy to take advantage of the benefits of DR-CAFTA should therefore be to design a strategy to increase production and export opportunities in agriculture and agro-industrial products. However, Guatemala also has one of highest rates of deforestation in the region and the world (1.7 percent) and highest population growth rate (2.6 percent). In the past much of the agricultural expansion has happened through frontier migration by subsistence farmers and clearing forested land for cultivation. Historically, the combination of both population pressure and in-migration has seriously

38. Gonzalez (2004), IADB (2006), Reardon and Flores (2006)

impacted frontier deforestation in Guatemala and has led to poverty and environmental degradation (Box 14)

Box 14. Population Pressure, In-Migration, and Deforestation

In Guatemala migration into the northern Peten resulted in clearing of one-half the forests in the region during 1950 to 1985. The combination of high population growth, fragmentation of agricultural plots into economically unviable sizes, and the lack of local alternative sources of employment pushed out-migration from rural areas — especially to Guatemala City and the Peten, the country's last agricultural frontier. The process of deforestation in the Peten continues to this day, even in and around national parks and the Maya Biosphere Reserve. Rural-rural migration appears to continue to drive this process of deforestation. If the trend continues the ecologically important remaining forests of northern Guatemala will disappear within two decades.

Source: Bilsborrow (2002).

A recent study looking at the expected effects of DR-CAFTA suggests that more than 60 percent of the very poor households in Guatemala are predicted to be negatively affected by the tariff reductions.[39] This will be predominant in households producing maize and bovine meat. For maize, while the price decrease is expected to be fairly small, the large role it plays in consumption and sale would mean that many lower income and vulnerable households are likely to feel the impact (especially in rural Peten). Bovine meat is almost the exact opposite. It is produced for sale by relatively few households, but the expected price change will be very large. The outcome is that not that many households will be negatively affected, but those household are likely to suffer substantial losses. The richer households are generally in a better position to adjust to losses than poor and vulnerable households.

There is thus a danger that increased pressure on the poor and most vulnerable could further push them to the frontiers in search of a livelihood. This has serious repercussions for the rapidly degrading forest areas — like Peten — where the most vulnerable live and will be negatively affected. Any strategy to promote agro-exports should be accompanied by significant attention to smallholders, especially those who are most vulnerable. Further, property rights, land titling, and land tenure are crucial, not only to ensure tenure security, but to promote intensified land use and reduce pressure on forests.

5. Recommendations

Guatemala faces a number of environmental challenges that could be accentuated by expanding opportunities offered by DR-CAFTA, but the agreement also offers opportunities to enhance the policy, legal, and regulatory framework and thereby create incentives to conduct operations in an environmentally sound manner both for domestic and foreign firms. There are three areas that require particular attention:

Industrial pollution needs to be tackled as growing pressure from trade expansion and privatization could further worsen the situation. There is a need for more flexible and efficient regulation that nevertheless provides strong incentives for polluters to change

39. Portner (2003).

their ways. Market-based instruments such as pollution taxes combined with other strategies such as public disclosure could be introduced in a gradual manner pending the implementation of a reasonable and acceptable monitoring and enforcement mechanism.

Building capacity to meet technical requirements is of utmost importance. Gaining access, especially to U.S. markets, offered by DR-CAFTA not only requires proper documentation of the entire production process, but also specific obligations for the registration of food, medicine, sanitary procedures. Although there is some transition assistance being provided, Guatemala will need to build capacity and create policies and programs that will help producers to meet export/import requirements and strengthen national systems to meet standards for the U.S. market.

Broader reforms at the local level should be included in strategies. Any agricultural expansion that could arise from opportunities offered by DR-CAFTA must be accompanied by developing an incentive structure targeting small-scale and landless farmers in order to ensure that it doesn't lead to further frontier expansion and accompanying deforestation.

V. Infrastructure Expansion

Guatemala's historically poor infrastructure has been a major limit to growth, a bottleneck that could become more severe as the country encounters greater foreign competition with the implementation of DR-CAFTA. A recent World Bank document[40] identified infrastructure development as the second most important economic growth determinant (following education). Rural poverty is also related to inadequate access to productive assets and rural infrastructure, notably road networks. Roads are an important part of the complex equation for reducing rural poverty and building social cohesion by improving and maintaining access to markets, schools, health centers, and other social and economic infrastructure (Box 15). The expansion of public investment, therefore, is seen as a key component in the second pillar of the Government's Development Plan.

The transport sector has become the main focus of central Government spending on public infrastructure.[41] Following public sector reforms of the 1990s, most of Guatemala's infrastructure spending in the energy and telecommunications sectors is now carried out by the private sector, while public sector involvement is largely limited to regulatory functions and expanding rural access. Moreover, public infrastructure spending in the water and sewer sector is the responsibility of municipal governments. In the transport sector, however, the Central Government has retained the lead role.

1. Transport Infrastructure in Guatemala

1.1 Roads

Guatemala's road network extends roughly 23,000 kilometers, of which 14,000 are "classified" roads and the rest are "unclassified" municipal roads. The classified roads are separated into Central American trunk highways that are 9 percent of the network, National and Departmental routes (39 percent) that connect to trunk highways and link departmental and municipal capitals, municipal roads (39 percent), and rural roads (13 percent).

Guatemala's road network is characterized by low road density indexes and problems of access, especially in rural areas. Road network density is low compared to other countries in Latin America and to countries with similar income levels, both in proportion to land area and population (Fig. 8). This translates into serious access problems. As shown in the Guatemala Poverty Assessment, 13 percent of households do not have access to roads that permit motorized vehicles and of the households with access, 28 percent experience blockages at some point during the year (20 percent for periods longer than 5 days).

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40. World Bank (2004) Country Economic Memorandum

41. In 2005 the MCIV (*Ministerio de Comunicaciones, Infraestructura y Vivienda*) executed an investment budget of about US$ 320 million of which about US$ 260 million was assigned to the transport sector, and of which approximately US$ 230 was for roads.

Box 15. Rural Roads, the Arteries for Poverty Reduction

Poverty in Guatemala is widespread in rural areas. An estimated 74 percent of the rural population (5.4 million) is poor, and about 24 percent are extremely poor. The proportion of indigenous people is also very high. About 80 percent live in rural areas and 76 percent of them are considered poor. They are among the poorest, most vulnerable, and marginalized segments of society.

Recent research attempts to understand the drivers of sustainable growth and poverty reduction in Guatemala. The research underlined insufficient access to productive assets, notably due to lack of road networks. A developed transport network to link the existing markets and those in rural areas would provide the rural people of Guatemala with an opportunity to become a substantial part of national, regional, and global development. Road network conditions are a major obstacle to sustainable growth and improved quality of life for the rural population in Guatemala. Moreover, deficiencies in infrastructure hamper productivity and competitiveness gains for different sectors, including tourism, agro-industry, and light manufacturing.

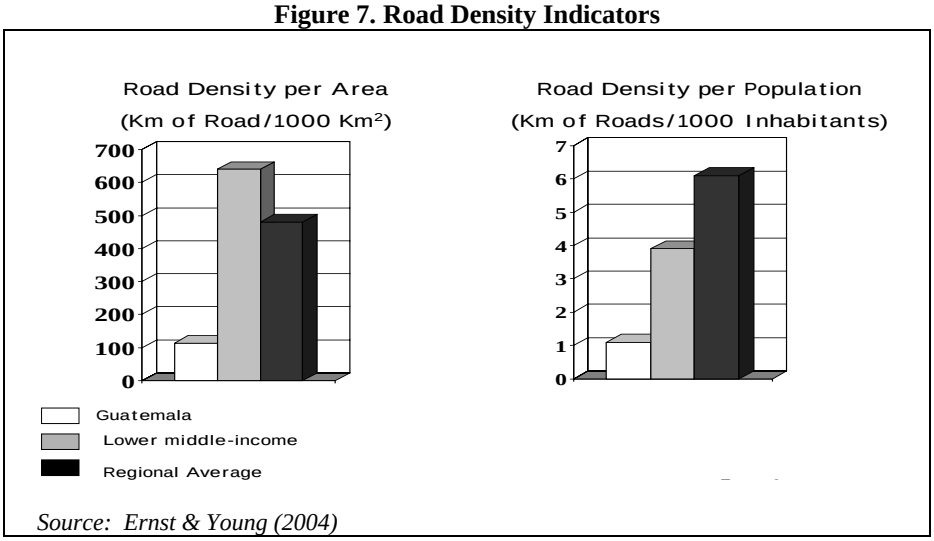
The table below shows the burden that rural people experience trying to gain access to water and services needed in their daily lives.

Transport Infrastructure and Accessibility in Guatemala (Selected Departments)

Parameter	Rest of the country	San Marcos	Huehue-tenango	Quiche	Baja Verapaz	Alta Verapaz	Average over targeted departments[a]
No. of sampling units	301	24	65	26	18	44	
No. of households (HHs) sampled	3,086	233	617	246	197	465	
Percent HHs without:							
Motorable roads	11	16	21	19	13	20	19
Public transport	48	63	68	48	42	73	63
Experiencing road closures	28	14	24	38	24	38	31
Time taken (min) to:							
Get water	13	15	14	14	8	14	13
Get wood	58	79	74	82	83	59	72
Reach a health facility[b]	47	49	51	29	88	48	51
Reach work place	46	29	48	31	44	37	42
Reach a market	41	72	66	61	29	72	62
Distance traveled (km) to:							
Get water	0.2	0.4	0.3	0.3	0.2	0.5	0.3
Get wood	1.2	1.4	1.6	1.7	2.2	1.8	1.7
Reach a market	8	8	10	7	3	9	9

a. Averages do not include San Marcos (considered separately as a pilot project).
b. A health facility is a hospital, a clinic, a health center, or a pharmacy.
Source: World Bank calculations using ENCOVI 2000, Instituto Nacional de Estadística, Guatemala.

Figure 7. Road Density Indicators



Source: Ernst & Young (2004)

The main road network[42] is in fairly good condition, but not so the rural and municipal roads. About 39 percent of the classified road network is paved, which is higher than the average in the rest of Central America (21 percent) or in Latin America (24 percent). Furthermore, only 20 percent of the main road network is rated as in bad condition. In contrast, less than 30 percent of the rural road network has had some type of maintenance, and an estimated 70 percent of the rural network needs rehabilitation or reconstruction.[43] Considering that one-half of Guatemala's population and most of its poor live in rural areas, these differences in road quality contribute significantly rural-urban inequalities.

1.2 Ports

The Guatemalan port system is the second largest in Central America (after Panama). Most cargo traffic is concentrated in three ports: Santo Tomas de Castilla and Puerto Quetzal, which are administered by the public sector, and Puerto Barrios, which is under private administration. Santo Tomas de Castilla mobilizes 43 percent of the container traffic. Puerto Barrios is best known for the transport of bananas (66 percent of its traffic), and Puerto Quetzal is used for grain and is the main channel for Guatemala's sugar exports.

The quality of Guatemala's port infrastructure is perceived to be low by users of the system. The results of the World Economic Forum's 2001 Executive Opinion Survey[44] suggest that Guatemala's ports are inefficient. The survey gave an average rating of 2.8 (on a scale of 1 to 7) for Guatemala, which is well below the average regional rating of

42. The principal road network includes the Central American trunk highways and certain segments of the National and Departmental route network.
43. The cost of reconstructing the deteriorated portion of the rural network is estimated to be at least US$ 110 million.
44. World Bank (2001), World Business Environment Survey

3.4 among countries with similar income levels. This low rating is attributable to Guatemala's obsolete regulatory framework for the port system, which attracts little investment and is inefficiently managed.

1.3 Government Strategy

The Government's strategy and objectives for the transport sector are laid out in two documents: *Lineamientos Generales de Gobierno, Período 2004-2008* and the *Programa de Reactivación Económica y Social 2004/2005* – known as the *¡Vámos Guatemala!* Program. With the advent of DR-CAFTA, the Government's transport strategy is aimed at providing adequate support to productive activities by consolidating building and maintenance programs for the road network. Two major projects are planned: (i) the 103.5-kilometer Metropolitan Beltway that is expected to benefit over 23 percent of the population (about 3 million people) living in the Departments of Guatemala and Sacatepequez; and (ii) the Northern Inter-oceanic Highway (*Transversal del Norte*) with an approximate 362-kilometer extension running from East to West. The Government plans an improved regulatory and institutional framework for ports and airports to increase investment and make ports more efficient. Containerization has been identified as an important issue and major investments in cargo handling infrastructure at all three main national ports are expected. The needed infrastructure expansion will challenge the current policy instruments used to manage the corresponding environmental impacts.

2. Managing the Environmental Implications of Infrastructure Expansion

The primary instrument for managing the environmental implications of infrastructure investments in Guatemala is the Environmental Impact Assessment (EIA). EIA is a new process in Guatemala and has been legally regulated only since 2003. As in many other countries in Latin America, EIA is a process driven by the need for environmental approval and licensing. According to the Regulation for Environmental Evaluation, Control and Follow-up 23-2003, all commercial and industrial projects need an environmental license. Nearly 2,000 EIA applications are submitted annually; a number that, despite impressive efficiency gains at MARN, is beyond its capacity to review and consider.[45]

Potential problems with using EIA to manage the implications of infrastructure expansion can be divided into two groups. The first arises from MARN's current approach to environmental management (or, in other words, the omnipresence of EIA in environmental management). The second group of problems entails faulty design or application of the components of the EIA process.

2.1 Environmental Policy Instruments and Process Description

Until 2003, the Environmental Impact Assessment (EIA)[46] was the only policy instrument utilized for licensing purposes. Article 8 of Decree 68-86 defines what kind of

45. MARN data for 2005
46. Section IV provides a more detailed analysis of the licensing process.

projects require an EIA: *"For each project, work, industry, or any other activity that by its characteristics can produce harm to natural resources, to the environment, or introduce harmful or obvious modifications to the landscape and to cultural resources of national patrimony, it will be necessary prior to their development to conduct an environmental impact assessment, carried out by technical experts in the subject matter and approved by the Ministry of Environment and Natural Resources . . ."* This open-ended provision meant that, in practice, all activities had to submit an EIA. This resulted in backlogs and poor evaluations.

A new regulation issued in 2003 — Environmental Regulation for Environmental Evaluation, Control and Follow-up 23-2003 — is intended to "regulate the evaluation, control and follow-up process, setting up technical procedures applicable for this purpose and defining and developing those actions needed to comply with the law".[47] With the issuance of this regulation, other instruments were established as alternatives to EIA (Box 16). The current intent of the EIA process in Guatemala is focused on granting an environmental license. The EIA process (Fig. 9) includes the following steps:

- Submission of an environmental evaluation to determine what type of EIA is needed;
- Preparation of an EIA by consultants or institutions approved by DIGARN (Dirección General de Gestión Ambiental y Recursos Naturales);
- Public notification of EIA preparation;
- Review and approval of the EIA by DIGARN and involvement of other ministries as called for;
- Response to EIA deficiencies;
- Granting of an environmental license;
- Posting of an environmental bond; and
- Follow-up and monitoring.

According to information obtained from MARN's General Office of Environmental Management and Natural Resources (DIGARN), during 2005 MARN processed 3,132 initial environmental assessments, 1,048 environmental impact assessments, and 24 environmental diagnostics that were examined by MARN's staff and its delegations.

Box 16. Evaluation Instruments under Governmental Agreement No. 23-2003

Under Governmental Agreement No. 23-2003, MARN created a regulation that establishes the basis for the following alternative evaluation instruments.

Strategic Environmental Assessment integrates environmental considerations in the development and implementation of country policies, plans, and programs, as well as national and transnational projects that support socioeconomic development and have environmental impacts in their area of influence.

47. As translated by the author: que norme la evaluación, control y seguimiento ambiental, estableciendo los procedimientos de carácter técnico, aplicables a ese propósito, definiendo y desarrollando las acciones necesarias para el cumplimiento de la ley.

Initial Environmental Assessment is carried out to determine if a project, work, industry, or any other activity by its characteristics can cause harm to natural resources, to the environment, or introduce harmful or obvious modifications to the landscape and to cultural resources of national heritage. The initial environmental assessment will consider the relevance of the environmental impact and its location to determine the appropriate evaluation instrument that corresponds to the anticipated impacts and required mitigation measures.

Environmental Impact Assessment is the technical evaluation that identifies a project's environmental impacts as well as measures to avoid, reduce, correct, and control harmful impacts. The coverage, depth, and type of analysis will depend on the project's anticipated impacts. This instrument is required only for projects, works, industries, and other new activities.

Environmental Risk Assessment examines the probability of exceeding a specific value of economic, social, or environmental consequences in a particular location and during a specified amount of time. The threat or probability of an occurrence or phenomenon with a specific intensity is compared with the vulnerability of exposed elements. The risk can originate from natural, geological, hydrological, atmospheric, technological, or man-made sources.

Social Impact Assessment is the process of evaluating the social and cultural consequences of a proposed project, work, industry, or any activity that can alter the lifestyle of populations and as a consequence, affect their quality of life.

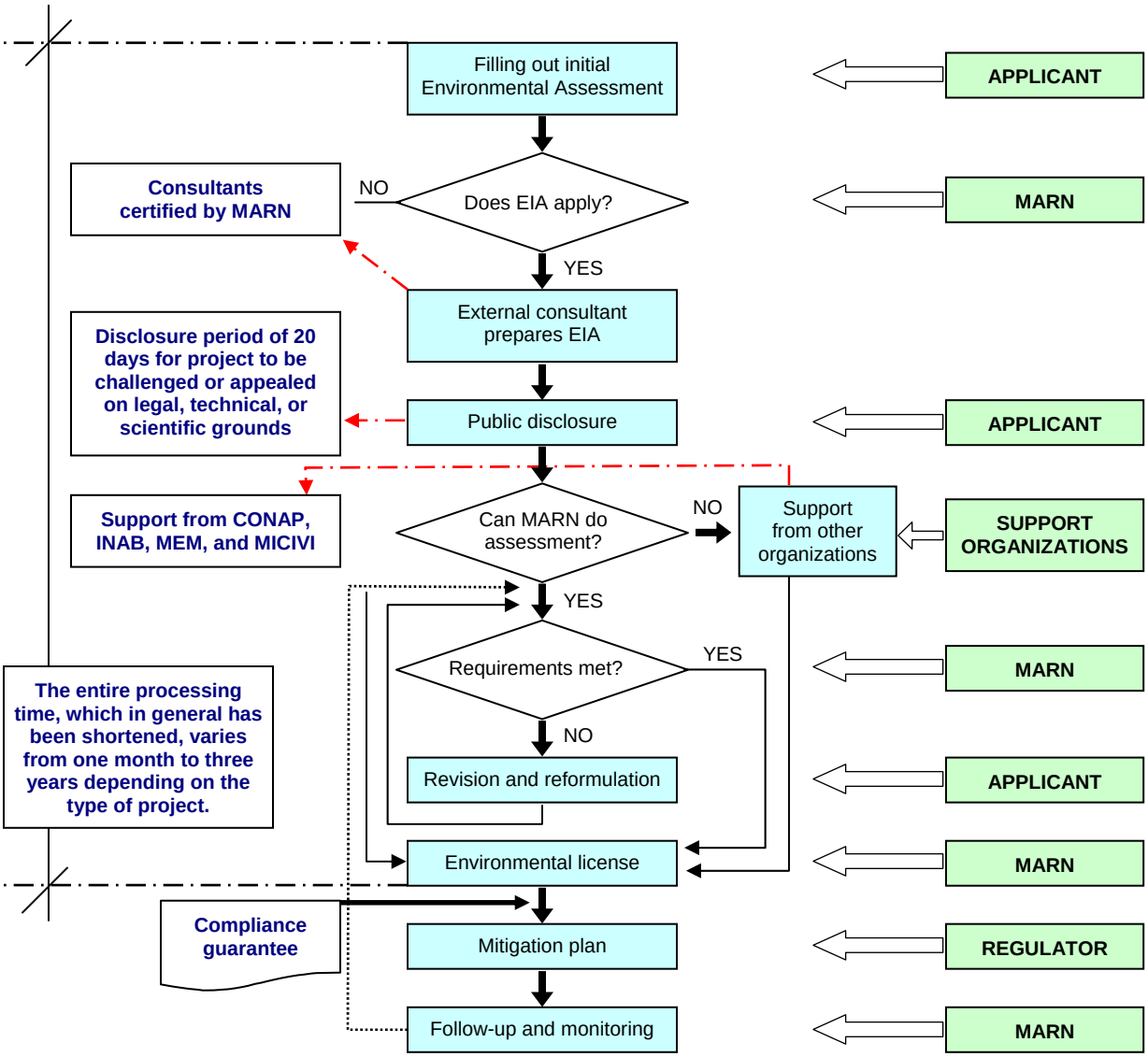
Assessment of Cumulative Effects is defined as the process of systematically analyzing and evaluating the combined environmental impacts of proposed projects, works, industries, or any other activity developed within a defined geographical area.

Environmental Diagnostic is an environmental assessment instrument that is conducted for a work, industry, or activity in which impacts are determined through direct samples or measurements, or by comparison with similar events. Its objective is to determine the corrective actions necessary to mitigate adverse impacts.

The regulation also defines environmental control and oversight instruments, including (i) environmental audits, (ii) environmental oversight and enforcement, and (iii) complementary instruments among others. It also mentions necessary mechanisms for public participation.

Third, applicants must hire a registered service provider to prepare the EIA. MARN administers this registry, and is developing further guidelines to certify service providers and update the registry in an effort to control the quality of the studies. However, the requirement of using service providers registered with MARN raises some issues, including the potential to foster anti-competitive practices, generating the assumption that MARN will grant permits to projects for which registered consultants prepare the EIA, opening opportunities for unethical and unfair practices.

Figure 8. Environmental Impact Assessment (EIA) Process



Despite worthy efficiency gains, the licensing process still has some significant problems. First, the backlog has been moved from the EIA to the initial environmental assessment. Furthermore, there is a lack of clear criteria for classifying projects (as to whether an EIA is necessary). Second, this lack of clear criteria and parameters about the EIA process gives the reviewing authority excessive discretion and increases the probability of error and inequality among similar projects. Moreover, it provides opportunities for illegally influencing the decisions taken by the authorities.

Fourth, the EIA process is so burdensome and slow (and lacking uniform assessment, verification, and enforcement) that it creates incentives for non-compliance. Although applicants are required to guarantee their compliance with a bond and are entitled to have it released upon compliance with applicable environmental protection measures, many renew their coverage rather than submit to an audit in order to release the bond.

The solution to these problems will require not only efficiency from improved processes, equipment, and training,[48] but must include a new approach to environmental management. Two key characteristics of the new approach should be: (i) delegation of some of MARN's functions — including licensing minor projects — to municipalities and environmental units of "high consumers" of permits like MCIV (under the guidance and supervision of MARN); and (ii) using additional policy instruments.

EIA became the main (and sometimes only) policy instrument to minimize or mitigate environmental impacts to third parties due to the absence of other instruments such as regulations for pollution control, zoning, and water management (Figure 8). Only by designing and implementing additional environmental policy instruments will Guatemala be able to attain efficient, effective, and affordable environmental management.

The new regulations should include environmental standards for the design, construction, operation, and maintenance of infrastructure. By adapting these standards, localized, direct impacts would be managed through the engineering process and be subjected to normal enforcement mechanisms rather than the EIA process. The EIA would, nonetheless, still play an important role in regulating infrastructure projects that may have significant effects according to a more selective screening process. The screening criteria may include, among others, protected areas, effects on vulnerable groups, and vulnerability to natural disasters.

Depending on the type of project, the entire process can take from one month to three years. As defined by best practices, EIA involves the following components:

- Screening to define what environmental tools are needed;
- Scoping of environmental and social impacts;
- Public participation;
- Assessment and evaluation of project impacts;

48. This report includes recommendations in these areas.

- Application of environmental mitigation, management, and monitoring plans; and
- Follow-up, monitoring, and compliance assessment.

Each component of the EIA process is discussed below.

2.2 Screening

Despite noticeable progress, Guatemala's EIA screening process remains ineffective; almost all commercial and industrial projects are subject to some form of EIA (about 2,000 projects each year). Recent progress was because of the development of an inclusion list (*lista taxativa*) based on the International Standard Industrial Classification for each industry type. The list includes industry type, a description of industrial activities, and a definition of four EIA categories:

- Category A — projects, works, and activities that are considered to have the most significant potential environmental impact or risk. It also includes so-call "mega-projects".
- Category B1 — projects that have a moderate to high potential environmental impact or risk.
- Category B2 — projects, works, and activities that have a low to moderate potential environmental impact or risk.
- Category C — projects, works, and activities that have a low environmental impact or risk.

While MARN developed an EIA procedures manual,[49] it is not widely used or referenced by DIGARN staff evaluating project EIAs. According to the procedures manual, the measurement of impact potential (high, moderate, low) and assessing each of the screening categories above considers these elements:

- Size of the project (number of employees)
- Area of the project in square meters
- Type of industrial process
- Environmental variables

Nowhere in this list, however, is there mention of the severity of environmental impact. This should be a key consideration in assigning the project to a category. Table 11 provides a brief description of the EIA procedures for each EIA category.

49. Ministerio de Ambiente y Recursos Naturales (MARN). 2004. Manual técnico operativo o manual específico de evaluación control y seguimiento ambiental.

Table 11. EIA Categories and Approval Timelines in Guatemala

Category	EIA Tool	Approval timeline
A	Alternative 1 – proponent submits an EIA following TOR prescribed by MARN Alternative 2 – proponent submits an Initial Environmental Assessment and MARN then decides what EIA instrument is required; normally EIA for new projects and Environmental Diagnostic for existing projects.	130 working days 2 months and 4 months if mega-project (proposed in the new regulation)[a]
B1	Alternative 1 – proponent submits an EIA following TOR prescribed by MARN Alternative 2 – proponent submits an Initial Environmental Assessment and MARN then decides what EIA instrument is required; normally EIA for new projects and Environmental Diagnostic for existing projects.	100 working days
B2	Submission of an Environmental Management Plan.	20 working days
C	Submission of an Initial Environmental Assessment.	20 working days

a. These approval times are from the new proposed Regulation for Environmental Evaluation, Control and Follow-up (2006) and have not been agreed to.
Source: Ministerio de Ambiente y Recursos Naturales (MARN). 2004. Manual técnico operativo o manual específico de evaluación control y seguimiento ambiental.

2.3 Scoping

The scoping of environmental impacts and their discussion with the affected public is not practiced in Guatemala. Instead, generic EIA terms of reference are available for the following:

- Initial Environmental Assessment — submitted for Category C projects and in advance for Category A and B1 projects;
- Environmental Impact Assessment — for Category A and B1 projects;
- Environmental Management Plan — for Category B2 projects; and
- Environmental Diagnostic — for Category A and B1 projects that are already operating.

The terms of reference specify what is needed in an EIA. The initial environmental assessment is used as a checklist to determine what additional environmental assessment tool is called for. In reality, no scoping process is finished that involves prioritizing issues and discussing key issues with affected stakeholders.

2.4 Public Participation

Article 33 of Regulation for Environmental Evaluation, Control and Follow-up (No. 23-2003) stipulates a process to inform the public about an EIA. The public has a period of 20 days to respond with comments about the EIA after notification of approval of the EIA terms of reference. Articles 50 and 51 of the regulation encourage proponents to involve the public at the earliest stage possible in the approval process and to discuss aspects of the EIA.

Public discussion of projects in Guatemala is undertaken for larger projects involving multinational companies. Such "consultation" is for information only rather than involving the public in the project decision making process. In practice, however, public discussions are not undertaken for most projects. In 2002, only 5 percent of all projects were publicly discussed.[50] There are no guidelines available from MARN for public consultation in the EIA process.

2.5 EIA Review, Evaluation, and Approval

There does not appear to be a procedures guide for reviewing and evaluating environmental impact assessment documents.[51] Two documents were provided by MARN and reviewed: (i) Technical Operating Manual (Specific Manual for Environmental Assessment, Control and Follow-up [MARN, 2004]) and (ii) Guide for Determination of the Significance of Environmental Impacts.[52] DIGARN staff reevaluate impacts stated in the proponent's EIA as part of an "independent" assessment. This process is time consuming and highly inefficient. Staff members focus on revaluating categorization of the significance of impacts rather than assessing whether the proposed mitigation is adequate or enough.

There do not appear to be guides for evaluating the effectiveness of mitigation measures and designing environmental management and monitoring plans.

2.6 Monitoring and Follow-up

Currently there is no monitoring and follow-up of the EIA process in Guatemala. DIGARN staff members are focused entirely on approval of EIA licenses. There are also no resources to cover trips to the field and no established audit and follow-up procedures in place. Staff members have little or no training in EIA follow-up and monitoring processes. There are no procedures manuals available at MARN for this purpose.

2.7 Organizational Capacity for EIA

MARN's Environment and Natural Resource Management Directorate (*Dirección General de Gestión Ambiental y Recursos Naturales, DIGARN*) is responsible for the review and approval of EIAs in Guatemala. There are 18 professionals in DIGARN[53] and each staff person is responsible for the review of four to seven EIAs each month. Most staff members did not have formal training in EIA review and analysis before joining the ministry, and not all received on-the-job training. A number of the country's sectoral ministries have established environmental units that play a role in the EIA process.

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50. Diagnóstico General del Proceso de Evaluación del Impacto Ambiental en Guatemala.
51. The following comments are based on a review of information and checklists that was provided by DIGARN on 8-9 March 2006.
52. Guía para la Ponderación de Datos de Significancia del Impacto Ambiental. MARN, Guatemala.
53. Information provided by MARN.

The environmental unit at MCIV (Ministry of Communications, Infrastructure and Housing) responsible for EIAs of roads is competent. It has well trained staff and guidelines to prepare the EIAs, however, the planning capacity of MCIV should also be strengthened. Although MCIV represents the chief policymaking and planning institution for the transport sector, it does not have the capacity to carry out needed sector planning activities. The ministry's planning office has one staff member, making it practically inoperative. To carry out specific analyses, MCIV looks for support from the planning offices of other entities subordinated under MCIV. Although these other offices often have ample analytic capacity, they do not have a sufficiently broad sector vision to develop sector action plans in an integrated way (including environmental considerations). This has led to an absence of an inter-modal vision and sector investment plan to guide resource allocation in the sector. An analytical component of this sector investment plans should be a Strategic Environmental Assessment (Box 17).

3. Recommendations

Since the enactment of EIA regulations in 2003, the Government of Guatemala has shown tremendous progress in evaluating the significance of environmental and social impacts associated with development projects. Despite significantly limited resources and experience, MARN has made noticeable progress in implementing an effective EIA system. However, "fine tuning" the current EIA system (i.e., improving each of its components — screening, scoping, public participation, monitoring, and enforcement), will not be enough to provide an efficient and effective way to address the environmental impacts of projects. MARN should consider delegating some functions to municipalities and the environmental units of other ministries and concentrate on assessing only those projects with significant, sensible, or unprecedented environmental impacts. MARN should also review the role that EIA plays in environmental management and look for new policy instruments (like economic incentives and emission standards) that could address environmental impacts more effectively and efficiently.

The following key recommendations are provided to help the Government continue to improve the efficiency and effectiveness of the EIA process in Guatemala. The first two recommendations are meant to improve the "environmental management system" by developing and applying new instruments. The remaining recommendations are aimed at improving the components of the EIA process.

3.1 Delegate Some Responsibilities to Municipalities and Environmental Units of Other Ministries

Despite recent worthy improvements in screening, MARN still has to handle close to 2,000 EIAs each year. Given their small and repetitive impacts, most of these EIAs could be handled by either the environmental units of other ministries or by municipalities (under the guidance and supervision of MARN). This would allow MARN to carefully evaluate the projects that deserve closer attention.

3.2 Develop and Implement Additional Regulations

There is a lack of key environmental legislation and regulations. Despite whatever improvements could be made to the EIA process in Guatemala, there remains a crucial need to promulgate key regulatory standards for discharges to the air, soil, and water. This should be a priority and form a key part of improving the environmental management process by not over-burdening the EIA process and bringing in new instruments better suited to deal with most pollution problems.

3.3 Strengthen Links Between EIA and SEA

With the help of CCAD/IUCN and other donors, undertake pilot studies for SEAs in Guatemala (Box 17). Prospective pilot projects include the following:

- Northern Inter-oceanic highway (Franja Transversal Norte);
- Tourism, including Mundo Maya;
- Policies for the mining and energy sector;
- Ports and airports; and
- International watersheds (in collaboration with CCAD).

Box 17. Benefits of a Strategic Environmental Assessment

Despite the country's reliance on the EIA system as the primary tool to mitigate environmental impacts and an urgent need to simplify an already overburdened system, EIA is not the proper tool for addressing all environmental implications of infrastructure expansion. One tool that has not yet been employed that would be beneficial is the Strategic Environmental Assessment (SEA). Guatemala's Regulations on Environmental Impact Assessment call for SEAs to integrate environmental considerations in developing and implementing the country's policies, plans, and programs. The benefits of an SEA as an upstream approach to incorporate environmental variables in planning and decision making are numerous. An SEA:

- Provides the necessary framework to analyze long-term environmental and social sustainability of infrastructure expansion plans;
- Integrates environmental, social, and economic considerations into the Government's infrastructure-expansion strategy;
- Recommends alternatives to ensure sustainable infrastructure development that safeguards the natural environment, achieves economic growth, promotes income and job creation, and ensures community participation in benefits;
- Promotes a learning process and builds in-country capacity for a broader understanding of sustainability implications of the infrastructure expansion strategy;
- Provides a systematic assessment at the macro-level of key critical issues for infrastructure expansion;
- Identifies needed actions and offers strategic alternatives to inform the policy-formulation process.

The SEA enables decision makers to develop policies and strategies that are based on a sound analysis and understanding of their sustainability implications. When the SEA is applied to the highest level possible in planning, it can focus on the source of environmental impacts rather than addressing symptoms. The results of the SEA can then cascade down the decision-making hierarchy and streamline subsequent, lower-level decisions. In this way, SEAs can overcome a major limitation of project-level EIAs, which only operate at the lower (downstream) end of the decision-making process. They can also identify specific measures to mitigate potentially adverse effects of carrying out policies, plans, and programs and can establish a framework for subsequent project level EIAs.

3.4 Improve the Use of Environmental Assessment Tools

Improve the efficiency of the environmental screening process. As it stands now, the process does not assess the severity of impact of proposed projects. It is recommended that the screening process be overhauled and that the inclusion list (*lista taxativa*) be strengthened to reduce uncertainty of an impact category.

- The use of scoping as a tool in environmental assessment and as a means to involve the public early on in the EIA process should be promoted by training in the subject and revision of the generic EIA terms of reference.
- Although the Regulation for Environmental Evaluation, Control and Follow-up (No. 23-2003) states that seven environmental tools, or instruments, are available, only three are used. Consideration should be given to expanding the use of strategic environmental assessment, cumulative effects assessment, and environmental risk assessment.
- As recommended by CCAD/IUCN, a project should develop best environmental practice manuals for certain industries (such as mining). These could easily be developed from World Bank Group resources such as the IFC EHS guidelines.
- Consider expanding this review to undertake a formal analysis of EIA effectiveness within MARN. This would be accomplished by conducting an EIA audit that focuses on: (i) reduction of the need for EIAs by improving efficiency of the screening process; (ii) improving approval time; (iii) developing standardized procedures for EIA review; (iv) reviewing the performance of environmental follow-up and monitoring; and (v) reviewing public participation processes.

3.5 Strengthen the Follow-up and Compliance Process

Carry out a review and follow-up process by establishing a dedicated "follow-up" unit. Undertake the following:

- Link the monitoring and follow-up unit to the legal compliance unit;
- Prepare a manual on EIA follow-up and develop standardized procedures; and
- Consider charging project proponents, of the "large and special" projects that the MARN will continue to evaluate for monitoring and follow-up (following the successful Colombian experience).

3.6 Strengthen Public Participation in the EIA Process in Guatemala

- Develop a standard guide to public participation in MARN and make it available to all proponents; such as a manual has been prepared by CCAD and could be adapted to Guatemala with a training program.
- Undertake pilot projects in various large infrastructure projects to show the benefits of public participation.

3.7 Improve the Institutional Capacity of MARN and the Environmental and Planning Units in Key Ministries

Once the role that EIA will play has been decided (in light of the new management instruments that must be developed, such as emission standards), an analysis of EIA capability in MARN should be conducted. This should include a review of technical capabilities, salaries, work conditions, standardized administrative procedures, and the provision of a comprehensive and inclusive training program.

The planning capacity of MCIV should also be strengthened to develop sector action plans in an integrated way (including environmental considerations).

VI. Conclusions and Recommendations

Guatemala, a small country rich in natural resources, needs to improve its competitiveness and promote investment to generate much needed economic growth to reduce poverty and improve human welfare. To do so, however, the government needs to provide the best affordable environmental management to secure sustainable economic development. The benefits of further improvements to environmental institutional and regulatory frameworks will be substantial not only to facilitate and sustain trade and infrastructure expansion, but also to preserve the natural resource base on which economic growth depends. Moreover, while DR-CAFTA is expected to bring new possibilities for investment and trade, the agreement will also raise scrutiny and monitoring of environmental compliance by Guatemala's trade partners. Maintaining low compliance rates would add unnecessary friction and raise the regulatory risks for investing in the country.

Meeting these challenges will not come from simply scaling-up MARN's current activities by increasing its budget and staff. Guatemala must learn from its experience and international best practices and adapt its institutions and organizations to local conditions and challenges. This study shows that further improvements to Guatemala's environmental management framework are required to achieve the following objectives:

- Define policy priorities and allocate resources accordingly.
- Improve coordination among the different government agencies with environmental responsibilities.
- Complement existing environmental management instruments (EIA) with, among other instruments, emission and discharge standards for pollutants and land zoning.
- Adjust environmental evaluation instruments, particularly EIA and SEA, to current development and environmental needs.
- Improve the monitoring and compliance framework according to national priorities and DR-CAFTA requirements.
- Integrate available environmental information and use it as a fundamental instrument for decision making, public participation, and accountability.
- Determine other medium- and long-term legal and regulatory gaps that need to be addressed to improve environmental conditions and set priorities in Guatemala.

The study suggests that if MARN concentrates on its core functions and works in coordination with other environmental agencies, ministries, and municipalities, most of these objectives can be achieved in a short time with minor adjustments to the existing framework of environmental management. In the long term, deeper reforms to the legal framework for water and transparency would be needed, but they need longer periods of maturation, consensus building, and negotiations, and ultimately congressional approval. Therefore, the study makes the following general recommendations.

1. Strengthen Environmental Quality by Integrating Environmental Considerations into Sectoral Policies; and Improve Effectiveness of MARN to Plan and Oversee Environmental Policies

1.1 Establish a Cohesive and Coordinated Environmental Framework

One of the greatest weaknesses identified in the environment sector is the lack of an environmental policy that orients the country toward specific goals and that clearly establishes short-, medium-, and long-term priorities. Although MARN has issued a policy on Environmental Conservation, Protection, and Improvement, it is not shared among all government agencies with environmental responsibilities. To ensure that a policy is developed that represents these different government agencies, both the Environmental Cabinet and the Consultative Council within MARN should take primary responsibility for developing such a policy.

In the short-term, the policy should (i) establish what it aims to achieve in the next 18 months, with measurable results that focus on addressing environmental priorities; (ii) contain principles that can be converted into action by government institutions; and (iii) clearly define responsibilities among different institutions as well as resource allocations. So that the policy can achieve concrete results in the short term, it is recommended that (i) the preparation process be led at the highest government level through the Vice Presidency; (ii) there is a well-defined and time-bound plan for preparing the policy; and (iii) training is provided for those involved in the preparation process.

In addition, the following four elements could help integrate environmental considerations into national economic and development policies in the medium- to long-term and strengthen institutional capacity in priority areas.

- Prioritize environmental issues in terms of their effect on economic development and poverty reduction, using both quantitative and participatory techniques, in order to select themes or sectors for which there is a definite recognition of the severity of environmental problems.
- Identify mechanisms that bring together different viewpoints during the policy formulation and implementation process, particularly the viewpoints of the most vulnerable groups.
- Identify mechanisms that ensure social accountability in the context of environmental issues such as passage of legislation for greater transparency in decision making and outcomes.
- Identify mechanisms through which social learning can occur so that key environmental priorities are prominent and always included in the policy agenda so that incremental improvement can occur over time.

1.2 Coordinate Environmental Concerns across Sectors

To achieve the above four elements in 5.1.1, environmental issues cannot be addressed in isolation. Given that the environment cuts across economic sectors and several institutions with environmental functions, cross-sectoral coordination and an improved decision-making process is essential. Cross-sectoral coordination bodies can help align the operations of different agencies. This coordination must be institutionalized at the fhighest government level — the Cabinet. Political analysis of the Cabinet system in Guatemala has shown that coordinating bodies have been successful when (i) they oversee a well-defined policy, priorities, or activity; (ii) there is a strong political leader to champion a cause; and (iii) technical and financial resources are available for monitoring and oversight.

Box 18. *Comisión Nacional del Medio Ambiente (CONAMA)* in Chile

Chile's National Commission for the Environment (Comisión Nacional del Medio Ambiente, CONAMA) offers a good example of coordination among ministries to further environmental objectives. CONAMA's Executive Director is appointed by the country's President. However, CONAMA´s highest authority is the Managing Council (Consejo Directivo), headed by the President's Chief of Staff (Ministro Secretario General de la Presidencia) and composed by the Ministers of Economy, Public Works, Agriculture, Health, Mining, Housing and Urban Affairs, Transport and Telecommunication, Planning, Education, and Foreign Affairs.

The council's main functions include: (i) coordinate government environmental policy and foster integration of environmental concerns in other policies; and (ii) coordinate enforcement actions between national agencies and municipalities.

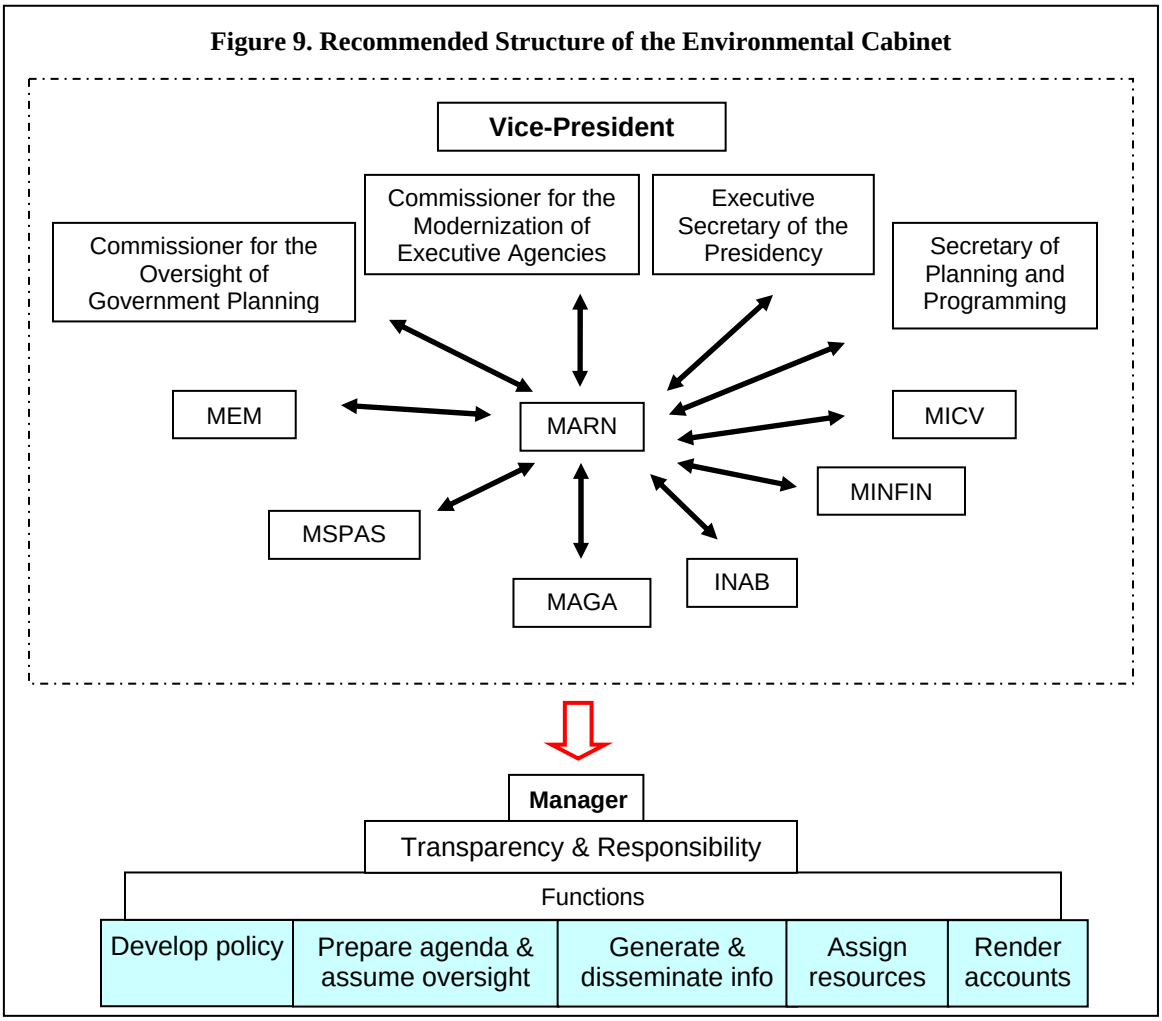
Due, among other things, to the coordination provided by CONAMA's Managing Council, Chile uses a wide range of instruments in connection with environmental policy: EIA, other regulatory instruments, economic instruments, voluntary agreements and planning and information instruments. The effective application of these instruments has allowed Chile to: (i) introduce a major and successful reform in water and sanitation service provision; (ii) increase significantly the amount of solid waste deposited in sanitary landfills; and (iii) reduce emissions of lead, and particulate matter, even as economic activity has expanded.

Although an Environmental Cabinet has been legally formed, it has not been convened by the Vice President to date. This Cabinet should be activated in order to improve cross-sectoral coordination among the different government agencies with environmental responsibilities and strengthen decision making. The report recommends that the Cabinet include (i) the Commissioner for the Oversight of Government Planning; (ii) the Commissioner for the Modernization of Executive Agencies; (iii) the Secretary of Planning and Programming; (iv) the Vice-Secretary of the Executive Secretariat of the Presidency; (v) the Minister of Environment and Natural Resources; (vi) the Minister of Public Health and Social Welfare; (vii) the Minister of Finance; (vii) the Minister of Agriculture; (viii) the Minister of Mines and Energy; (ix) the Minister of Communications and Housing; (x) the Manager of INAB; and (xi) the Executive Secretary of CONAP. Further, it is recommended that the Cabinet have the following responsibilities:

- Define short-term policies.

- Define an agenda and oversight mechanisms for the policies.
- Coordinate actions and facilitate the flow of information among the entities involved in policy implementation.
- Provide information and disseminate results to stakeholders, as well as to the public.
- Periodically evaluate progress on the implementation of policies with the support of data, results, and experience achieved through inter-sectoral coordination and learning.

Figure 9. Recommended Structure of the Environmental Cabinet



Decree 68 of 1986 and Decree 90 of 2000 created the Ministry to establish environmental policies and norms. To date, MARN has centered its efforts on evaluating environmental assessments — where it concentrates 46 percent of its budget — but has shown less emphasis on planning a national environmental policy, coordinate environmental efforts with other line ministries, and monitor and enforce. As such, the report recommends that MARN prioritize its role in managing governance instruments such as environmental laws, regulations, and enforcement actions, in particular by setting minimum standards, regulating resource management, ensuring compliance with obligations, and

decentralizing its implementation responsibilities. The following sections 1.3, 1.4 and 1.5 provide specific recommendations.

1.3 Strengthen MARN's Role as a Sectoral Leader

Establish a Consultative Council to serve as an advisory board to the Ministry for policy and regulation. The Council should, at a minimum, have the following responsibilities:

- Provide recommendations on the formulation and design of sectoral policies and norms.
- Recommend actions that support compliance with the legal framework.
- Present initiatives that support the development of new norms.
- Promote programs on pollution prevention, environmental education, and information and dissemination.
- Act as an information source to support transparency and public participation (see 5.8).

The report also recommends that the Council include all stakeholders that hold environmental responsibilities, including representatives of the public and private sectors, and civil society. Given that the Council is an inclusive body representing vast interests and points of view, it should have (i) a clear work program; (ii) priorities that can be realized in the short term; and (iii) a coherent strategy that represents its multiple members. To ensure that the Council is effective, it should meet quarterly and provide periodic reports on its actions. Once the Council has been formed, it is recommended that MARN make a formal request to international organizations such as OAS and UNDP to obtain resources (both technical and financial) to support the Council's recommendations.

1.4 Decentralize and Delegate Responsibilities

MARN's delegations have multiple responsibilities but few resources to fulfill them, which in turn limits the coverage and capacity of the country's environmental management. As such, the report recommends developing a strategy to increase the efficiency and effectiveness of environmental management via decentralization of environmental functions. This strategy would begin with an initial phase of decentralizing the receipt and management of environmental assessment applications and information requests, and later be extended to include environmental oversight and analysis functions.

To implement this first phase, the report makes these recommendations:

- Review and/or prepare procedural manuals so that processing applications and information requests is conducted in a uniform and systematic manner.
- Establish agreements with government organizations that have departmental and municipal offices to support the decentralization process (i.e., support responding to application and information requests).
- Provide technical support to existing environmental units in MCIV, MEM, INFOM, municipalities, among others, so that environmental assessments

originating from these agencies' investments are more complete, facilitating MARN's analysis and oversight of these assessments.

- Promote creation of more environmental units in other ministries and private organizations and councils so that they can support preparation of environmental assessments and facilitate their analysis and oversight by MARN.
- Issue norms and technical standards to certify public and/or private laboratories, enabling the verification of compliance with mitigation plans. In cases where these certification agencies do not exist, they should be created.

1.5 Promote Coordination with Municipalities

Given that the Municipal Code establishes that many environmental responsibilities fall under the jurisdiction of municipalities that are autonomous government entities, it is essential that MARN collaborate with municipalities for the following reasons:

- To provide technical standards, technical assistance, and training that will improve municipal performance in carrying out their responsibilities.
- To promote the establishment or strengthening of municipal environmental units that (i) support the development of municipal projects, including those that support environmental protection; and (ii) can enforce and oversee the protection of natural resources and mitigation of environmental damages due to municipal activities.

In the short term, the report recommends that MARN establish support agreements with the most populated municipalities (those with a population over 100,000). It also recommends that MARN carefully examine initial efforts at INFOM, in which a unit has been established to support environmental mainstreaming in municipal projects that are presented to the agency for financing. The design of this unit could be used as a model to be replicated at the municipal level in the medium term.

The report also recommends that MARN establish a dialogue with municipalities through the National Association of Municipalities (ANAM) about competencies legally assigned to national and municipal authorities that might overlap (e.g., management and use of natural resources and management of solid waste). ANAM should also be included within the Consultative Council to ensure adequate coordination.

2. Address Regulatory Gaps

The country's Environmental Protection Law, Decree 68 of 1986, calls for a number of regulations to protect its natural resources, including air quality, water systems, audio and visual pollution, endangered species, national heritage, and flora and fauna. Guatemala has issued more than 2,500 legal instruments; however, only 65 percent of those regulations required by Decree 68 of 1986 have been approved at different government levels (from congressional to municipal). Such scattered approval has led to differences in their authority and stability and more importantly, a lack of coherent management. For example, for regulations about water resource management, the country's Health Code

regulates water quality for human consumption, the Law of Protected Areas establishes actions to protect water basins, the Electricity Law regulates river rights of way for hydroelectricity generation, and COGUANOR establishes the minimum standards for potable water. Although the water sector relies on the greatest number of regulations, it lacks a framework for sustainable water resource management that defines institutional responsibilities for its management.

The legal framework also relies too heavily on command-and-control instruments that treat violations as a crime, but economic incentives to promote compliance and achieve the desired conduct are not yet in place (see 5.7).

This report recommends — in addition to the regulation on wastewater discharges that is in the process of being issued — in the short-term prioritizing the modification or issuance of the following legal instruments:

- Internal legal framework for the Ministry of Environment and Natural Resources, including the functions of the Consultative Council.
- Emissions regulations for fixed and mobile sources.
- COGUANOR standards, particularly for water, air, and environmental services.
- Review and analyze legal frameworks that pertain to the Penal Code. This activity should be the focus of a national meeting of international and national legal experts with the objective of producing proposals for discussion in Congress.
- Assess gaps at the sectoral, institutional, and spatial levels as a basis to modify the sector's legal framework (Decree 68-86).
- Develop proposals for needed laws, such as the Water Law, Citizen Participation Law, and Law establishing Public Consultation.

3. Promote Compliance with Environmental Laws

Despite the legal and administrative advances that MARN has made, one of greatest challenges to the sector is compliance with environmental laws, regulations, and standards. Compliance has centered on the use of environmental assessments. In addition, the treatment of environmental infractions in the country's Penal Code does not allow evidence that would lead to corrective actions. A definition of what constitutes environmental damage is also lacking, making it difficult to apply sanctions with discretion. The system, however, is designed to sanction or prohibit actions that the country does not have the capacity to monitor. To confront these challenges, the report recommends developing incentives to promote compliance accompanied by credible sanctions that are based on clear and cost-effective standards.

The report also recommends that MARN lead a legal reform that considers modifying the Penal Code, the legal framework for the environment sector (Decree 68-86), and the issuance of needed sectoral laws, such as a water resources management law, a law on citizen participation, and a law on public consultation. Institutional strengthening and

technical assistance will be required to support the definition of technical standards and monitor compliance.

To improve incentives, the report recommends:

- Greater coordination with private organizations that promote corporate social responsibility and with business councils and other agencies that promote international environmental certification (e.g., ISO).
- Conducting cost-benefit analyses of other instruments that promote environmental stewardship.
- Reactivating the Guatemalan Fund for the Environment (FOGUAMA) to provide financial resources for technical assistance, certification, and information gathering.

4. Improve Effectiveness and Efficiency of Environmental Management

Since the enactment of EIA regulations in 2003, the Government has made great strides in evaluating the significance of environmental and social impacts associated with development projects. Despite significant resource limitations, MARN has made noticeable progress in implementing the EIA system. However, "fine tuning" the current EIA system (i.e., improving each of its components — screening, scoping, public participation, monitoring, and enforcement) will not be enough to provide Guatemala with an efficient and effective way to address the environmental impact of projects. MARN should consider delegating some functions to the environmental units of other ministries and municipalities and concentrate on assessing only those projects with significant, sensible, or unprecedented environmental impacts. MARN should also review the role that EIA plays in environmental management and look for additional policy instruments (such as economic incentives and emission standards) that could address environmental impacts in a more effective and efficient way.

The following key recommendations are provided to help the government continue to improve the efficiency and effectiveness of Environmental Management. The first three recommendations are meant to improve the "environmental management system" by delegating some responsibilities and by developing and applying additional instruments. The remaining recommendations are aimed at improving components of the EIA process.

4.1 Delegate Some Responsibilities to Municipalities and Environmental Units of Other Ministries

Despite recent worthy improvements in screening, MARN still has to handle close to 2,000 EIAs each year. Given their relatively minor and repetitive impacts, most of these EIAs could be handled by either the environmental units of other ministries or by municipalities (under the guidance and supervision of MARN). This would allow MARN to carefully evaluate the projects that deserve closer attention.

4.2 Develop and Implement Additional Regulations

There is an overall lack of key environmental legislation and regulations. Despite whatever improvements could be made to the EIA process in Guatemala, there remains a

crucial need to implement key regulatory standards for discharges to air, soil, and water. This should be a priority and form a key part of improving the environmental management process by not over-burdening the EIA process and bringing in additional instruments better suited to deal with most pollution problems.

4.3 Strengthen Links Between EIA and SEA

With the assistance of CCAD/IUCN and other organizations, undertake pilot studies for SEAs in Guatemala. Prospective pilot projects include:

- Northern inter-oceanic highway (Franja Transversal Norte).
- Tourism, including Mundo Maya.
- Policies for the mining and energy sector.
- Ports and airports.
- International watersheds (in collaboration with CCAD).

4.4 Improve the Use of Environmental Assessment Tools

Improve the efficiency of the environmental screening process. At present, the screening process does not assess the severity of impact of proposed projects. The screening process should be overhauled and the inclusion list (*lista taxativa*) should be strengthened to reduce uncertainty.

The use of scoping as a tool in environmental assessment and to involve the public early in the EIA process should be promoted by training and revision of the generic EIA terms of reference.

Although the Regulation for Environmental Evaluation, Control and Follow-up (No. 23-2003) states that seven environmental tools, or instruments, are available, only three are actually used. Consideration should be given to expanding the use of strategic environmental assessment, cumulative effects assessments, and environmental risk assessment.

As recommended by CCAD/IUCN, a project should be implemented to develop best environmental practice manuals for certain industries (e.g., mining). These could easily be developed from existing World Bank Group resources such as the IFC EHS guidelines.

Consider expanding this review to undertake a formal analysis of EIA effectiveness within MARN by conducting an EIA audit focusing on: (i) reduction of the overall need for EIAs by improving efficiency of the screening process, (ii) improving approval time, (iii) developing standardized procedures for EIA review, (iv) reviewing the performance of environmental follow-up and monitoring, and (v) reviewing participation processes.

4.5 Strengthen the Follow-up and Compliance Process

Implement a review and follow-up process by establishing a dedicated “follow-up” unit. Undertake the following:

- Link the monitoring and follow-up unit to the legal compliance unit.
- Prepare a manual on EIA follow-up and develop standardized procedures.
- Consider charging project proponents of the "large and special" projects that MARN will continue to evaluate for monitoring and follow up (following the successful Colombian experience).

4.6 Strengthen Public Participation in the EIA Process in Guatemala

- Develop a standard guide to public participation in MARN and make it available to all proponents. A manual on public participation has been prepared by CCAD and could be adopted specifically to Guatemala with a training program.
- Undertake pilot projects in various large infrastructure projects as demonstration projects to show the benefits of public participation.

4.7 Improve the Institutional Capacity of MARN and the Environmental and Planning Units in Key Ministries

Once the role that EIA will play has been decided (in light of the additional management instruments that must be developed, e.g., emission standards) an analysis of EIA capability in MARN should be conducted. This should include a review of technical capabilities, salaries, work conditions, standardized administrative procedures, and provision of a comprehensive and inclusive training program.

The planning capacity of MCIV should also be strengthened to develop sector action plans in an integrated manner (including environmental considerations).

5. Support the Decision Making Process by Establishing a Unified Environmental Information System, and Promoting Public Participation

5.1 Unify Environmental Information Systems

The country currently relies on isolated information systems. Although they do store useful environmental information, it is not gathered in such a way nor is it sufficiently comprehensive to be useful to decision makers and civil society (see 5.8). Those information systems most utilized include the Geo-referenced Information System (SIG) and the Health Management Information System (SIGSA). University investigation centers, primarily the Universidad Rafael Landivar, Universidad del Valle, and Universidad San Carlos de Guatemala, as well as private centers such as IDEADS also maintain environmental information systems.

In order to create a unified information system in which data are gathered in a format consistent with other database systems, the report recommends that in the short term MARN, through the Manager of the Environmental Cabinet, the Consultative Council, and the National Institute of Statistics, identify institutions that collect data in the country as well as what information they have available. Indicators should be defined that can be used by decision makers to inform policy development and measure implementation performance. To support the monitoring of indicators, an agreement should be reached

among these institutions on report frequency, data collection instruments, and responsibilities for data collection. In the medium term a pilot exercise should develop this information system and disseminate data on implementation performance. Based on the results of this exercise, the information system could then be institutionalized to publicly provide information via MARN's website.

5.2 Introduce Periodic Analytical Work to Set Priorities

Both the richness of natural resources and severity of environmental deterioration in Guatemala make a strong argument for the role of environmental resources in reducing poverty, fighting hunger, and lowering child mortality. Policymakers who set environmental standards need to be aware of the likely consequences of environmental degradation on the economy, while economic (and sectoral) policymakers must consider the environmental implications of current and projected patterns of consumption and production. MARN should develop periodic analytical work such as environmental accounting to determine the cost of environmental degradation.

5.3 Promote Public Participation in the Environmental Agenda

Improving institutions and organizations is not only about building and strengthening legal frameworks and organizations, but is also about building citizen engagement and voice. While improvements to legislative oversight and administrative mechanisms do help, they are insufficient unless accompanied by increased demand from citizens and other stakeholders for better access, quality, and responsiveness in the delivery of public services. Greater citizen involvement can be facilitated by disclosing data on environmental quality, enabling public review of proposed laws and regulations, and enhancing spaces and opportunities for citizen and civil society engagement with political actors. Participatory methods such as expanded data collection and analysis can then be used by the public to hold policymakers accountable, thus enhancing both public sector accountability and performance — the demand side of governance.

This report recommends that:

- The Consultative Council play an active role in policy formation and inter-institutional coordination.
- Consultation mechanisms on proposed policies, laws, regulations, and norms be improved by organizing workshops or target groups to discuss proposals.
- To improve oversight of mitigation plans and social audits, the experience of the Association of Community Environmental Monitoring (AMAC) should be studied.
- Coverage and frequency of both public disclosure programs and environmental education should be increased.

6. Manage the Environmental Implications of DR-CAFTA

Guatemala environmental challenges could be accentuated by expanding opportunities offered by DR-CAFTA. But the agreement also offers opportunities to enhance the policy, legal, and regulatory framework and thereby create incentives to conduct

operations in an environmentally sound and equitable manner. There are three areas that require particular attention:

6.1 Tackle Industrial Pollution Because Growing Pressure from Trade Expansion and Privatization Could Further Worsen the Situation

There is a need for a more flexible and efficient regulation that nevertheless provides strong incentives for polluters to change their ways. Environmental assessments do not fulfill the need for an incentive-based regulation and monitoring system. Market-based instruments such as pollution taxes/charges combined with other strategies such as public disclosure could be introduced in a gradual manner pending the implementation of a reasonable and acceptable monitoring and enforcement mechanism.

6.2 Build Capacity to Meet International Standards

Gaining access, especially to U.S. markets offered by DR-CAFTA, not only requires proper documentation of the entire production process, but also specific obligations to register food and medicine and comply with plant and animal sanitary regulations and food safety labels/certificates. Although there is some transition assistance provided, Guatemala will need to build capacity and create policies and programs that will help producers meet export/import requirements and strengthen national systems to meet sanitary standards of the U.S. and world markets.

6.3 Create a Strategy to Promote Agricultural Growth that Encompasses Broader Reforms at the Local Level

Any agricultural expansion that could arise from opportunities offered by DR-CAFTA must be accompanied by developing an incentive structure targeting small-scale and landless farmers in order to ensure that it doesn't lead to further migration, frontier expansion, and accompanying deforestation. For both agricultural and non-agricultural growth there is a need for better natural resource management of land, forest, and water resources in a more equitable and sustainable manner. This will require an appropriate legal and institutional framework (including enforcement) that recognizes the rights of indigenous groups to natural resources, and improves their access to these assets.

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IBRD 34997

GUATEMALA
ROAD NETWORK

- SELECTED CITIES AND TOWNS
- DEPARTMENT CAPITALS
- NATIONAL CAPITAL
- RIVERS
- PAN AMERICAN HIGHWAY
- MAIN ROADS
- RAILROADS
- DEPARTMENT BOUNDARIES
- INTERNATIONAL BOUNDARIES

Source: CCAD Spatial Database.

MÉXICO
BELIZE
HONDURAS
EL SALVADOR
PACIFIC OCEAN
Gulf of Honduras

PETÉN
ALTA VERAPAZ
BAJA VERAPAZ
IZABAL
QUICHÉ
HUEHUETENANGO
SAN MARCOS
TOTONICAPÁN
QUETZALTENANGO
SOLOLÁ
CHIMALTENANGO
GUATEMALA
SACATEPÉQUEZ
EL PROGRESO
ZACAPA
CHIQUIMULA
JALAPA
JUTIAPA
SANTA ROSA
ESCUINTLA
SUCHITEPÉQUEZ
RETALHULEU

Paxbán
Carmelita
El Naranjo
Tikal
Melchor de Mencos
Flores
La Libertad
Sayaxché
San Luis
Barillas
Chajul
Cobán
Cahabón
El Estor
Modesto Méndez
Livingston
Puerto Barrios
Morales
Los Amates
Huehuetenango
Santa Cruz Del Quiché
Totonicapán
Salamá
San Marcos
Quetzaltenango
Sololá
Chimaltenango
Antigua Guatemala
El Progreso
Zacapa
Chiquimula
Esquipulas
Mazatenango
Retalhuleu
Ocós
Champerico
Escuintla
Cuilapa
Jutiapa
Sipacate
San José
Las Lisas

Tajumulco ▲(4220 m)

Sierra de los Cuchumatanes
Chamá Mts.
Sierra de Santa Cruz
Sierra de las Minas
Sierra Madre

San Pedro
Usumacinta
Pasión
Salinas
Machaquilá
Mopán
L. Petén Itzá
L. de Izabal
Ixcán
Salegua
Negro
Polochic
Cahabón
Motagua
Chiyú
Cancuén
Sarstún
L. Atitlan
Suchiate

To Tuxtla Gutiérrez
To Tonalá
To El Progresso
To La Unión
To La Unión

0 20 40 60 Kilometers
0 10 20 30 40 50 Miles

91°W 90°W 89°W 88°W
92°W
18°N 17°N 16°N 15°N 14°N 13°N

SEPTEMBER 2006

IBRD 34996

GUATEMALA HYDROGRAPHIC NETWORK

- RIVER BASIN BOUNDARIES
- SELECTED CITIES AND TOWNS
- DEPARTMENT CAPITALS
- NATIONAL CAPITAL
- RIVERS
- PAN AMERICAN HIGHWAY
- MAIN ROADS
- RAILROADS
- INTERNATIONAL BOUNDARIES

Source: CCAD Spatial Database.

MÉXICO
BELIZE
HONDURAS
EL SALVADOR
PACIFIC OCEAN
Gulf of Honduras

Paxbán
Carmelita
Tikal
El Naranjo
Melchor de Mencos
Flores
La Libertad
Sayaxché
San Luis
Sarstún
Livingston
Puerto Barrios
Modesto Méndez
Cahabón
El Estor
Morales
Los Amates
Barillas
Chajul
Cobán
Huehuetenango
Salamá
Santa Cruz Del Quiché
Totonicapán
San Marcos
Quetzaltenango
Sololá
Chimaltenango
GUATEMALA
Antigua Guatemala
Jalapa
Zacapa
El Progreso
Chiquimula
Esquipulas
Mazatenango
Retalhuleu
Ocós
Champerico
Escuintla
Cuilapa
Jutiapa
Sipacate
San José
Las Lisas

Sierra de los Cuchumatanes
Chamá Mts.
Sierra de Santa Cruz
Sierra de las Minas
Sierra Madre

San Pedro
L. Petén Itzá
Usumacinta
Pasión
Salinas
Machaquilá
Mopán
Cancuén
Ixcán
Chixoy
Salegua
Negro
Polochic
Motagua
Cahabón
L. de Izabal
L. Atitlan
Suchiate

Tajumulco (4220 m)

To Tuxtla Gutiérrez
To Tonalá
To El Progresso
To La Unión
To La Unión

0 20 40 60 Kilometers
0 10 20 30 40 50 Miles

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SEPTEMBER 2006

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GUATEMALA ECOSYSTEMS

- EVERGREEN AND SEMI-EVERGREEN BROAD-LEAVED FORESTS
- EVERGREEN AND SEMI-EVERGREEN MIXED FORESTS
- EVERGREEN CONIFEROUS FORESTS
- SEMI-DECIDUOUS BROAD-LEAVED FORESTS
- SEMI-DECIDUOUS MIXED FORESTS
- MANGROVE FORESTS
- DECIDUOUS BROAD-LEAVED FORESTS
- CONIFEROUS SHRUBLANDS
- BROAD-LEAVED SHRUBLANDS
- MIXED SHRUBLANDS
- AQUATIC PRODUCTIVE SYSTEMS
- AGRO-PRODUCTIVE SYSTEMS
- FOREST PLANTATIONS
- FRESHWATER WETLANDS
- SAVANNAS
- AREAS WITH SPARSE VEGETATION
- URBAN AREAS
- WATER BODIES
- NO DATA
- MAIN CITIES
- DEPARTMENT CAPITALS
- NATIONAL CAPITAL
- RIVERS
- INTERNATIONAL BOUNDARIES

Source: CCAD Spatial Database.

CCAD

GUATEMALA

MÉXICO

BELIZE

HONDURAS

EL SALVADOR

Gulf of Honduras

PACIFIC OCEAN

Paxbán
Carmelita
El Naranjo
Tikal
Melchor de Mencos
Flores
La Libertad
Sayaxché
San Luis
Barillas
Chajul
Cobán
Cahabón
El Estor
Livingston
Puerto Barrios
Modesto Méndez
Morales
Los Amates
Zacapa
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Chiquimula
Esquipulas
Salamá
Santa Cruz Del Quiché
Totonicapán
San Marcos
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Jalapa
Cuilapa
Jutiapa
Sipacate
San José
Las Lisas

0 20 40 60 Kilometers
0 10 20 30 40 50 Miles

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OCTOBER 2006

IBRD 34999

GUATEMALA
PROTECTED AREAS

PROTECTED AREAS
SELECTED CITIES AND TOWNS
DEPARTMENT CAPITALS
NATIONAL CAPITAL
RIVERS
PAN AMERICAN HIGHWAY
MAIN ROADS
RAILROADS
DEPARTMENT BOUNDARIES
INTERNATIONAL BOUNDARIES

Source: CCAD Spatial Database.

CCAD

91°W 90°W 89°W 88°W
92°W
18°N 17°N 16°N 15°N 14°N 13°N

MÉXICO
BELIZE
HONDURAS
EL SALVADOR
PACIFIC OCEAN
Gulf of Honduras

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To Tuxtla Gutiérrez

HUEHUETENANGO
Barillas
Sierra de los Cuchumatanes
Selegua
Huehuetenango
Ixcán

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Chajul
Chamá Mts.
Cobán
Cahabón
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Tajumulco (4220 m)
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QUETZALTENANGO
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SUCHITEPÉQUEZ
CHIMALTENANGO
Chimaltenango
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Jalapa
JALAPA
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Esquipulas
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Jutiapa
JUTIAPA
SANTA ROSA
Sipacate
San José
Las Lisas

To La Unión
To La Unión

0 20 40 60 Kilometers
0 10 20 30 40 50 Miles

SEPTEMBER 2006