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Country Environmental Analysis
Improving Environmental Management to Address Trade Liberalization and Infrastructure Expansion

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Table of Contents

Acronyms and Abbreviations i

Acknowledgements v

Executive Summary, Conclusions and Recommendations vii

1. Introduction vii
2. Institutional and Organizational Analysis viii
3. Managing the Environmental Implications of DR-CAFTA and Infrastructure Expansion x
4. Infrastructure xi
5. Conclusions and Recommendations xiii
   - 5.1 Improve Environmental Policy Coordination and Priority Setting through Better Functioning of The National Environmental Management System (SINAMA) and the National Environment Council (CONAMA). xiv
   - 5.2 Improve Effectiveness and Efficiency of the EIA System xvii
   - 5.3 Compliance with Environmental Regulations through Enhancement of Inspection and Enforcement Capacities xix
   - 5.4 Better Support for Environmental Decision Making and Monitoring through Improving the Environmental Information System (SIA) and Public Participation xx
   - 5.5 Addressing Medium- and Long-term Legal and Regulatory Gaps xxii
   - 5.6 Need for a Water Resources Management Framework xxii

I. Introduction 1

1. Background and Bank's Assistance 1
   - 1.1 Background and Policy Challenge 1
   - 1.2 Development Plan and Bank's Assistance 2
2. Rationale, Objectives, and Value Added 2
   - 2.1 Rationale 2
   - 2.2 Objective 3
   - 2.3 Value Added 3
   - 2.4 Organization of this Country Environmental Analysis 3

II. Key Environmental Issues and the Cost of Environmental Degradation 5

III. Institutional and Organizational Analysis 11

1. Institutional Framework (the Rules of the Game) 11
   - 1.1 Environmental Policies 11
   - 1.2 Legal and Regulatory Framework 13
   - 1.3 Environmental Policy Instruments 20
   - 1.4 Stakeholder Participation 26
   - 1.5 Compliance and Enforcement Mechanisms 30
2. Organizational Analysis (the Players) 32
   - 2.1 Functioning of the Ministry of Environment and Natural Resources (MARN) . 32
   - 2.2 Interaction of the Ministry with other Key Actors 39
3. Institutional and Organizational Performance 46
   - 3.1 Assessing the Strengths and Weaknesses 46

3.2 Benchmarking the Applied Framework 48

IV. Trade Liberalization and the Environment in El Salvador 53

1. Introduction 53
2. Trade and Environment Debate 54
3. An Overview of the Literature 56
4. Trends in Exports and Imports 57
5. Meeting Technical Requirements of Trade 63
6. Foreign Direct Investment 65
7. Conclusions and Policy Recommendations on Trade 67
8. Infrastructure Expansion 70
9. Managing the Environmental Implications of Infrastructure Expansion 73

V. Conclusions and Recommendations 77

1. Improve Environmental Policy Coordination and Priority Setting through Better Functioning of The National Environmental Management System (SINAMA) and the National Environment Council (CONAMA). 78
2. Improve Effectiveness and Efficiency of the EIA System 81
3. Compliance with Environmental Regulations through Enhancement of Inspection and Enforcement Capacities 83
4. Better Support for Environmental Decision Making and Monitoring through Improving the Environmental Information System and Public Participation 84
5. Addressing Medium- and Long-term Legal and Regulatory Gaps 86
6. Need for a Water Resources Management Framework 86

Annex I. Environmental Commitments under DR-CAFTA 88

Annex II. Defining Dirty Industries 91

Annex III. Development Policy Loan (DPL) Triggers and Country Environmental Analysis (CEA) Recommendations 92

Annex IV. Key Stakeholders 94

References 97

Tables

Table 1: Emission Sources: Ratio of PM2.5 and PM10 7
Table 2: Economic Cost of Recent Natural Disasters 10
Table 3: MARN Budget and Employment Allocations 34
Table 4: Key Benchmarks of the Institutional and Organizational Frameworks 50
Table 5: Trade Patterns in El Salvador (in US$ millions) 53
Table 6: Typical Rates for Water Use for Various Industries 59
Table 7: Fastest-Growing Export Sectors, 1999–2003 61
Table 8: Estimated Effects of U.S. Tariff Elimination 62
Table 9: Foreign Direct Investment in El Salvador (in millions of US$) 66
Table AII-1: Average Sectoral Rankings for Conventional Air Pollutants, Water Pollutants, and Toxics/Metal 91

Figures

Figure 1: Key Elements of the Organizational Proposal for Strengthening the National Environmental Management System xvi
Figure 2: PM^{10} Concentrations in San Salvador, January–December 2004 (µg/m3) 6
Figure 3: PM^{10} Concentrations in San Salvador, March–August 2005 (µg/m3) 7
Figure 4: EIA Administrative Process 22
Figure 5: Permit of Environmental Retrofitting Process 23
Figure 6: Ministry of Environment and Natural Resources 33
Figure 7: Number of Positions in the MARN 35
Figure 8: El Salvador's Revealed Comparative Advantage 58
Figure 9: Sectoral Trend in El Salvador's Exports (in $'000s, 1999–2003) 59
Figure 10: Sectoral Trend in El Salvador's Imports, (in $'000s, 1999–2003) 60
Figure 11: Equity of Basic Services Coverage 72
Figure 12: Key Elements of the Organizational Proposal for Strengthening the National Environmental Management System 80

Boxes

Box 1: El Salvador's National Environmental System ix
Box 2: Establishing an Environmental Impact Assessment Task Force xviii
Box 3: The Secret Forests of El Salvador 9
Box 4:The Role and Practice of Strategic Environmental Assessments 13
Box 5: Tailoring the Legal Framework to Needs and Capacities 19
Box 6: Participation and Environmental Legislation in El Salvador 27
Box 7: The OECD Reference Checklist for Regulatory Decision Making 28
Box 8: Emphasizing Compliance Promotion: The Canadian Example 30
Box 9: Other Bodies Involved in Environmental Inspection 37
Box 10: Guiding Principles for Reform of Environmental Enforcement Authorities 38
Box 11: Government Organizations with Key Environmental Responsibilities 40
Box 12: Environment in DR-CAFTA 56
Box 13: Water Use and Pollution from Food Processing 59
Box 14 Water Pollution and Health Damage 61
Box 15: Weak Institutional and Legal Frameworks 62
Box 16: Getting Small-scale Firms to Comply with Global Standards 65
Box 17: Competitiveness and the Environment 67
Box 18: Policy Recommendations 69
Box 19: Water and Sanitation 71
Box 20: Transport 73
Box 21: Benefits of an SEA 75
Box AI-1: DR-CAFTA Dispute Settlement on Environmental Enforcement at a Glance 89

MAPS

1. Road Network ..... Map # IBRD35091
2. Hydrographic Network ..... Map # IBRD35090
3. Ecosystems ..... Map # IBRD35092
4. Protected Areas ..... Map # IBRD35093

Acronyms and Abbreviations

ALIDES	Alliance for Sustainable Development (Alianza para el Desarrollo Sostenible)
ANDA	National Water and Sewerage Administration
ANEP	National Association of Private Enterprises (Asociación Nacional de la Empresa Privada)
ANP	Natural Protected Areas System (Sistema de Áreas Naturales Protegidas)
ARI	Acute respiratory illness
BOD	Biochemical oxygen demand
CAS	Country Assistance Strategy
CCAD	Central American Commission on Environment and Development (Comisión Centroamericana de Ambiente y Desarrollo)
CEA	Country Environmental Analysis
CEL	Executive Hydroelectric Commission of Rio Lempa (Comisión Hidroeléctrica Ejecutiva del Río Lempa)
CEMA	Executive Environmental Committee (Comité Ejecutivo del Medio Ambiente)
CENTA	Centro Nacional de Tecnología Agropecuaria y Forestal
CEPA	Canadian Environmental Protection Act
CESTA	Salvadoran Centre for Appropriate Technology (Centro Salvadoreño de Tecnología Apropiada)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMURES	Corporation of Municipalities of the Republic of El Salvador (Corporación de Municipalidades de la República de El Salvador)
CONACYT	National Council on Science and Technology (Consejo Nacional de Ciencia y Tecnología)
CONAMA	National Environment Council (Consejo Nacional del Medio Ambiente)
DA	Environmental Diagnosis
DPL	Development Policy Loan
DR-CAFTA	Dominican Republic-Central American Free Trade Agreement
EECCA	Eastern Europe, Caucasus, and Central Asia
EI	Environmental impact
EIA	Environmental Impact Assessment
EIS	Environmental Information System
EMP	Environmental Management Plan
ENFA	Environmental Enforcement Authorities
EU	European Union
FDI	Foreign Direct Investment
FGR	Attorney General's Office (Fiscalía General de la República)
FONAES	Environment Fund of El Salvador (Fondo Ambiental de El Salvador)
FORGAES	Strengthening Environmental Management in El Salvador (Fortalecimiento de la Gestión Ambiental en El Salvador)
FOVIAL	Road Maintenance Fund

FUNDE	National Foundation for Development (Fundación Nacional para el Desarrollo)
FUSADES	Salvadoran Foundation for Social and Economic Development (Fundación Salvadoreña para el Desarrollo Económico y Social)
GDP	Gross domestic product
IADB	Inter-American Development Bank (Banco Interamericano de Desarrollo)
LAHTI	Linear Acute Human Toxic Intensity index
LMA	National Environment Law
MAGES	Ministry of Agriculture and Livestock (Ministerio de Agricultura y Ganadería)
MARN	Ministry of Environment and Natural Resources
MASS	Metropolitan Area of San Salvador
MINEC	Ministry of Economy
MODDIV	Dissemination Module
MOP	Ministry of Public Works
MSPAS	Ministry of Public Health and Social Assistance
NAFTA	North American Free Trade Agreement
NGO	Nongovernmental organization
NSO	Binding Technical Standards
OECD	Organisation for Economic Co-operation and Development
ONI	National Investment Institution (Organismo Nacional de Inversión)
PA	Environmental Permit
PAA	Environment Adaptation Plan
PCP	Pentachlorophenol
PM	Particulate matter
$PM^{2.5}$	Particulate matter 2.5 micrometers or less in diameter
PM^{10}	Particulate matter 10 micrometers or less in diameter
PMA	Environmental Management Program
PNC	National Civil Police (Policia Nacional Civil)
PPPs	Plans, programs, and policies
PRISMA	Environment and Development Research Program of El Salvador (Programa Salvadoreño de Investigación sobre Desarrollo y Medio Ambiente)
REDI	Recent Economic Development in Infrastructure Report
RIA	Regulatory Impact Analysis
SAFI	Integrated Financial Management System
SEA	Strategic Environmental Assessment
SEMA	Environmental Secretariat
SIA	Environmental Information System (Sistema de Información Ambiental)
SIC	Standard Industrial Classification
SICA	Central American Integration System (Sistema de Integración Centroamericana)
SIGET	Superintendent of Energy and Telecommunications
SINA	National Environmental System
SINAMA	National Environmental Management System
SNET	National Service for Territorial Studies (Servicio Nacional de Estudios

	Territoriales)
SPS	Sanitary and phytosanitary
TBTs	Technical barriers to trade
TORs	Terms of reference
UA	Environmental unit
UNEP	United Nations Environment Programme
EPA-US	United States Environmental Protection Agency
WHO	World Health Organization
WTO	World Trade Organization

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Executive Summary

1. Introduction

Since emerging from a 12-year civil war in 1991, El Salvador has made remarkable progress in consolidating peace and democracy. The reestablishment of peace and the country's sustained economic reform efforts promoted an average annual rate of 4.9 percent in economic growth in the 1990s, after a decade of poor performance. Despite the country's impressive record of reforms and prudent macroeconomic policies, growth levels have slowed in recent years due in large part to external shocks. The new government's plan, "Safe Country 2004–2009," emphasizes inclusive economic growth and improved equity through expanding access to infrastructure.

Key pillars of this national development plan include trade promotion, through the Dominican Republic-Central America Free Trade Agreement (DR-CAFTA), and an ambitious program of infrastructure expansion. DR-CAFTA and the infrastructure expansion program represent both a challenge and an opportunity for environmental institutions in El Salvador. DR-CAFTA is expected to increase trade, investment, and economic growth, and improve the welfare of El Salvador's population. However, the extent of these gains will depend on El Salvador's capacity to implement complementary policies. The trade agreement by itself is unlikely to lead to substantial developmental gains without parallel improvements in areas such as infrastructure, trade facilitation, institutional and regulatory reform, and innovation and education. 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 and a much needed expansion in infrastructure (especially improving the provision of water supply and sanitation services).

El Salvador faces severe degradation of its natural resources, especially its natural forests, soil, air quality, and water resources. Only 2 percent of its natural forests remain, which in the region compares only with Haiti. On the positive side, there is evidence of a significant recovery of secondary forests and biodiversity, as reported by ongoing studies (Hecht and others 2005). Water availability of 2,625 cubic meters per year (m3/year)[1] for human consumption and productive activities is increasingly critical, generating severe water shortages, constraining economic activity, and generating conflicts among users. The health impact of environmental degradation has been estimated at around 2.5 percent of gross domestic product (GDP) (Panayotou 1998; Strukova 2005), of which inadequate water and sanitation services, poor hygiene, and ambient and indoor air pollution constitute the highest costs.

[1] Countries that have a per capita availability of water below 1,700 m3/year are classified as being under water stress.

2. Institutional and Organizational Analysis

As part of a novel approach to preparing a Country Environmental Analysis, this report devised a new analytical methodology to explore not only the basic institutional framework (policies, laws, regulations, instruments) in place but also the organizational and human capacities to enforce them in an effective, efficient, transparent, and accountable way.[2] The synthesis of these two dimensions provides benchmarking elements disclosing key strengthens and weaknesses in the El Salvador framework.

Concerning the institutional framework, there is no doubt that since the late 1990s El Salvador 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. This framework comprises a general environmental law and complementary laws that address specific environmental concerns, particularly in forestry, protected areas, and mining, including associated regulations and technical standards. The National Environment Law (LMA) established the Ministry of Environment and Natural Resources (MARN), a coordination system for public policies (National Environmental Management System, SINAMA), formal mechanisms for the participation of the civil society and the private sector (for example, the National Environment Council, CONAMA) (Box 1), and a variety of environmental policy instruments.

Given the new challenges facing the country with the signing of DR-CAFTA and the proposed scale up of investments in infrastructure, there is a need to speed up the consolidation of the organizational aspects in El Salvador. This report concludes that meeting these challenges requires short- and long-term actions, and identifies a significant potential for short-term institutional adjustments and improvements that require only further implementation of the current LMA.

In terms of the institutional framework, El Salvador needs more detailed technical regulations, more effective licensing process, and less burdensome, clearer responsibilities and accountabilities for MARN and the environmental units in public agencies, and stronger capacity for coordination on the part of the Executive Environmental Council (CEMA). Policies and regulations often lack sufficient detail for implementation, and there are overlaps or contradictions with other policies. For example, while the mandates of a number of agencies – such as the National Water and Sewerage Administration (ANDA), and the Executive Hydroelectric Commission of Rio Lempa (CEL), and MARN - bestow specific responsibilities to these agencies with respect to water supply and water quality, responsibility for overseeing the sustainable management of water resources is unclear. In addition, laws and regulations rely almost exclusively on command-and-control measures to address noncompliance rather than providing a complete set of more flexible mechanisms to foster compliance, complemented by coercive measures. Moreover, a wider use of environmental policy instruments like the Strategic Environmental Assessment, environmental information,

[2] The process was based on an extensive review questionnaire approved by the government and a series of bilateral discussions with key stakeholders.

public participation, and economic instruments would improve environmental conditions in a cost-effective manner. The law contemplates these instruments. However, in practice MARN has developed and relied exclusively on the ex ante environmental control provided by the Environmental Impact Assessment (EIA) process.

Box 1: El Salvador's National Environmental System

The National Environment Law (LMA) of 1998 was the product of a broad consultation process and established the National Environmental Management System (SINAMA) composed of the Ministry of Environment and Natural Resources (MARN) as coordinator of the system, the environmental units in other ministries, and the autonomous and municipal institutions. MARN is responsible for developing the country's environmental policy and for dictating the required policies for the design, organization, and operation of SINAMA. The law also defined the main objectives of SINAMA as the establishment of: (a) environmental coordination mechanisms in the entities and institutions to mainstream environmental considerations into the country's development; (b) an organizational and functional structure for environmental management in public sector entities and institutions; (c) procedures to generate, systematize, register, and submit information on environmental management and the state of the environment as a basis for preparing environmental plans and programs, for evaluating the environmental impacts of sectoral policies, and the environmental management performance of SINAMA's members; (d) MARN's responsibility for the oversight of each entity or institution implementing or supervising environmental management; and (e) participation and coordination guidelines between SINAMA and MARN. SINAMA also provides mechanisms for public participation.

MARN is responsible for planning national environmental policy. Public institutions are responsible for establishing environmental units that (a) coordinate and supervise environmental policies, plans, programs, projects, and actions within their institution; (b) ensure that the institution complies with environmental norms; and (c) ensure the necessary interinstitutional coordination in environmental management, in accordance with the guidelines issued by MARN.

The law introduces nine instruments of environmental policy: (a) environmental zoning within national and regional development and zoning plans, (b) environmental evaluation, (c) environmental information, (d) public participation, (e) programs for economic incentives, (f) the national environmental fund and any other financial program for environmental projects, (g) science and technology applied to the environment, (h) environmental education, and (i) the national environmental strategy and Plan of Action. Implementation of the instruments has been concentrated on the Environmental Impact Assessment (EIA), and further development of the others is needed to complement a comprehensive environmental policy.

However, international experience shows that successful institutional frameworks not only need laws and regulations that are tailored to the specific needs and problems of a country, but that also consider the capacities and limitations of the organizations responsible for implementing effective environmental management, that is, the "players" in a given institutional and regulatory environment. In this context, and despite steady progress in creating and strengthening its environmental organizations and capacities, the room for substantive improvement seems clear.

Possibly the main challenge to improving environmental management in El Salvador is making the organizations more efficient and effective in implementing the new institutional framework, starting with strengthening coordination and clarification of environmental priorities to align resources accordingly. There is evidence that Salvadoran environmental organizations are not effectively addressing some of the highest-priority environmental issues, such as water scarcity and quality, or serious environmental health problems caused by air and water pollution. The study also found that there is plenty of room to improve coordination among key players of SINAMA, particularly between MARN and the environmental units and sector agencies. As an example, better

coordination among MARN and the environmental units of ANDA, CEL, and the Ministry of Public Works (MOP) could reduce the costs of the EIA process and, at the same time, increase its effectiveness.

Therefore, the Ministry needs to further develop and implement coordination schemes to mainstream environmental considerations in key sectors, and introduce additional policy instruments to promote compliance with environmental regulations and environmental management plans. These institutional challenges need to be considered in light of a new economic context driven by the ratification of DR-CAFTA, and accelerated infrastructure expansion to address logistical bottlenecks.

3. Managing the Environmental Implications of DR-CAFTA and Infrastructure Expansion

El Salvador's integration into the international economy has increased significantly over the past decade, aided by substantial trade liberalization, which will increase further as the trade-expanding measures of DR-CAFTA take effect. While the economic importance of the traditional agricultural sector has been declining (mainly coffee, sugar, and cotton), (from 13.5 percent of GDP in 1996 to 11.0 percent in 2003), the manufacturing sector's contribution (including the maquila industry) has increased significantly (from 21.5 percent of GDP in 1996 to 24.0 percent in 2003). This rather dramatic shift in El Salvador's trading patterns has important implications for the environment and the use of natural resources. An analysis of trade and investment patterns provides a broader understanding of the environmental implications of greater economic openness.

This report concludes that the gradual opening up of the economy has been accompanied by a notable shift in the composition of exports and production toward activities that are more water intensive and more polluting. Manufacturing output and exports, especially, are now significantly higher, increasing, and in sectors that are water-pollution intensive (such as food processing, textiles and leather, chemicals, and metal works) (Mani and Wheeler 1998). This is a worrisome trend given that water pollution in El Salvador has already reached high levels, affecting both the environment and sources of drinking water. Since manufacturing industries may receive a significant boost from DR-CAFTA, continued absence of adequate regulations and enforcement could pose a serious threat to both human health and the environment.

In agriculture, many of the benefits from DR-CAFTA for El Salvador are expected in agro-industrial products with high value-added, such as vegetable oils, processed food and fruits, sesame seeds, indigo (*indigofera anil*), sugar, ornamental flowers, honey, and nuts. While guaranteed market access provides the opportunity for growth in these areas, small producers could face significant problems complying with sanitary and phytosanitary (SPS) requirements and technical barriers to trade (TBTs), because of increasing global concern about food safety and competitiveness in export markets. In this regard, El Salvador faces a number of challenges. The country lacks adequate facilities and equipment to undertake due diligence regarding environmental compliance, and there are a number of gaps in national policy and regulations, including lack of

systematized identification, documentation, and certification procedures. Addressing these challenges requires developing both process-related and practical approaches to meeting global technology and certification standards.

The opening of the economy over the past few years has also been accompanied by a steady increase in foreign direct investment (FDI), especially in the manufacturing and maquila sectors, where investment has grown from US$490 million to US$825 million in the last five years. The environmental implications of increased FDI flows are difficult to estimate, however, in the absence of more detailed data. Experience in other countries shows that it is not clear whether lax environmental regulations attract foreign investment. While there are no specific arrangements for monitoring the environmental performance of multinational enterprises, El Salvador could use this opportunity to create the right (and uniform) incentives for all enterprises to conduct operations in an environmentally sound and responsible manner.

4. Infrastructure

To reduce poverty and foster sustainable growth, El Salvador faces two key policy challenges related to infrastructure: shortfalls in the provision of basic social infrastructure, particularly in water and sanitation; and the high logistical cost related to roads capacity and limitations of transport and storage facilities. The study also shows that the social costs of poor basic social infrastructure are staggering. For instance, the health costs of inadequate water supply, sanitation, and hygiene alone amount to about 1 percent of GDP (Strukova 2005). Estimates done as part of this study show that 53 percent of poor children in rural areas suffer between 1 day and 15 days per month from waterborne diseases (mainly diarrhea). In rural areas, families without household water connections spend between 9 and 14 percent of their time collecting water. A recent study conducted by the World Bank to review the status of the infrastructure sector shows that the poor are not the primary beneficiaries of subsidy schemes intended to make potable water affordable (REDI 2005). Only 22 percent of the yearly cost of water subsidies goes to poor households. With regard to access to paved roads—vital for accessing markets, jobs, health care, and education—the poor in rural communities live, on average, more than five kilometers from the nearest paved road.

El Salvador must improve its logistics infrastructure and services in order to increase productivity and export competitiveness. While in recent years the country's businesses have benefited from significant improvements in some infrastructure services, most notably electricity and telecommunications, they still find it too costly to transport their goods to ports. Road congestion and related costs have increased, and exports suffer from higher shipping costs than those from other Central American countries.

According to the REDI study (2005), to achieve universal coverage in electricity, potable water, and sanitation, maintain consistent telecommunications coverage, and improve the roads in need of repair, El Salvador would have to increase its annual investment in infrastructure from current 1.5 percent of GDP to a minimum of 2.9 percent. To meet this goal, investment expenditures would need to be much more efficiently allocated (in

the sense of maximizing net benefits including environmental costs and benefits for the country) and effectively implemented. This required infrastructure expansion will challenge the policy instruments currently used to manage the corresponding environmental impacts.

The primary instrument for managing the environmental implications of infrastructure investments in El Salvador is the EIA. This tool 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 EIA system's screening procedures, in which MARN determines whether a project requires an EIA, are too broad. The Ministry has not established clear criteria for defining those projects with significant environmental impacts and, thus, does not tailor environmental assessment requirements to the expected environmental risks of the investment. Instead, it relies almost exclusively on providing standard, sector-specific terms of reference (TORs) to project proponents of those activities requiring an EIA, which are generally expensive and time consuming, with unrealistic mitigation measures that are difficult to monitor and enforce.

These standard requirements are not only cumbersome for project proponents, but also for the Ministry, which is required to review each EIA report without a screening process to prioritize which activities need an EIA. Currently, 300 to 400 EIA reports are submitted to the Ministry for approval each year. Given the lack of prioritization and the limited number of Ministry staff assigned to review these reports, the Ministry has a current backlog of over 2,500 EIAs[3]. This situation is unsustainable and has substantial negative effects on economic activity and on the overall competitiveness of the country. If this situation is not improved, the problems of licensing are expected to be exacerbated with the expected increase of trade and infrastructure investment. Moreover, the lack of institutional capacity and the paucity of data severely limit the ability to monitor the implementation of Environmental Management Plans (EMPs), including prevention and compensation actions, and prove that the environment is not improving and development is being affected. According to official figures, out of the total value of environmental bonds provided by project proponents during 1999–2004 to guarantee compliance with EMPs, less than 15 percent has been collected.[4] This sheds doubt on the extent to which EMPs are implemented.

With the Ministry's emphasis on EIAs, other useful environmental instruments that might better address the environmental implications of infrastructure expansion included in the law, such as the Strategic Environmental Assessment (SEA), have been overlooked. There are many benefits of an SEA as an upstream approach to incorporate environmental variables into planning and policy decisions. When the SEA is applied at the highest level possible in planning, it can be focused on the "source" of environmental impacts. The results of the SEA can then cascade down the decision-making hierarchy and streamline subsequent, lower-level decisions. In this way, the SEA can overcome a major limitation of project-level EIAs, which only operate at the lower (downstream) end of the decision-making process. The SEA can thus be a powerful tool to efficiently and

[3] Since the preparation of this CEA the backlog has been substantially reduced.
[4] "Medio Ambiente en Cifras/El Salvador 2003."

effectively address the environmental implications of infrastructure expansion plans, programs, and policies, not only because it would facilitate more informed decisions, but also because it has the potential to lower the subsequent EIA compliance costs of individual projects. The country has a legal basis for conducting SEAs,[5] but this tool has not been used because it still lacks the required regulations.

5. Conclusions and Recommendations

El Salvador, a small country with limited national resources, needs to grow through its main comparative advantage, which is its strong culture of competitive businesses. To do so, however, the government needs to ensure that the best affordable environmental management is in place to secure sustainable economic development. The benefits of further improvements to the environmental institutional and regulatory frameworks will be substantial not only to facilitate and sustain trade and infrastructure expansion, but in terms of preserving 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 the scrutiny and monitoring by El Salvador's trade partners regarding environmental compliance. Maintaining low compliance rates would add unnecessary friction and raise the regulatory risks for investing in the country.

The solution to these problems will not come from simply scaling-up MARN's current activities by increasing its budget and staff. This study shows that further improvements of El Salvador's existing environmental management framework are required to achieve the following objectives:

1. Improving coordination among the different government agencies with environmental responsibilities and other stakeholders by enhancing the decision-making process and public participation;
2. Adjusting the environmental evaluation instruments, particularly the EIA and SEA, to current development and environmental needs;
3. Complementing environmental evaluation instruments with technical guides and norms;
4. Strengthening the monitoring and compliance framework according to national priorities and DR-CAFTA requirements;
5. Further developing the Environmental Information System (EIS) as a fundamental instrument for decision making, public participation, and accountability; and
6. Determining other medium- and long-term legal and regulatory gaps that need to be addressed to improve environmental conditions and priority setting in El Salvador.

The study suggests that most of these objectives can be achieved in a short time with minor adjustments of the existing framework of environmental management, which are likely to be implemented by executive orders. In the long term, deeper reforms to the legal framework for water and territorial management, and transparency, would be

[5] El Salvador is the second country in the region to incorporate SEAs into its legal environmental framework.

needed, but they need longer periods of maturation, consensus building, and negotiations, and ultimately congressional approval. Therefore, the study makes the following recommendations.

5.1 Improve Environmental Policy Coordination and Priority Setting through Better Functioning of The National Environmental Management System (SINAMA) and the National Environment Council (CONAMA).

5.1.1 The Need for Better Institutional Coordination

Environmental issues have gained prominence given the impacts of natural disasters and environmental degradation, and thanks to government efforts to address these issues over the past few years. However, environment policy is still too remote from the economic development concerns, priorities, and polices of the government, and from other ministries and agencies. The environmental policy coordination established by SINAMA has been unable to act as a framework to mainstream environmental policies and priorities and to coordinate environmental tools, budgets, and resources across the government agencies. MARN's resources have been overstretched and its agendas dominated by short-term priorities, weakening its planning and driving the capacities of SINAMA. The creation of CONAMA in September 2004 and the required formalization of the functions of CEMA provide an ideal opportunity to improve institutional coordination and to establish a better decision-making process with more public participation.

CONAMA functions as the consultative body of the Ministry with key stakeholders. It includes seven representatives of the private sector and civil society, and the Minister of Environment, who appoints them. Although it may be too early to assess the effectiveness and relevance of CONAMA's advice, the appointment of strong critics of the government's environmental actions may improve transparency and inclusiveness.

The decree that created CONAMA[6] calls for a regulation that would formalize the functions of CEMA, which is in theory composed of representatives from CONAMA, but in practice has included representatives of all the government entities with environmental functions. This regulation has not been issued and these bodies operate in an ad hoc manner.

Therefore, this report recommends that the government strengthen the operational framework of SINAMA (Figure 1) by:

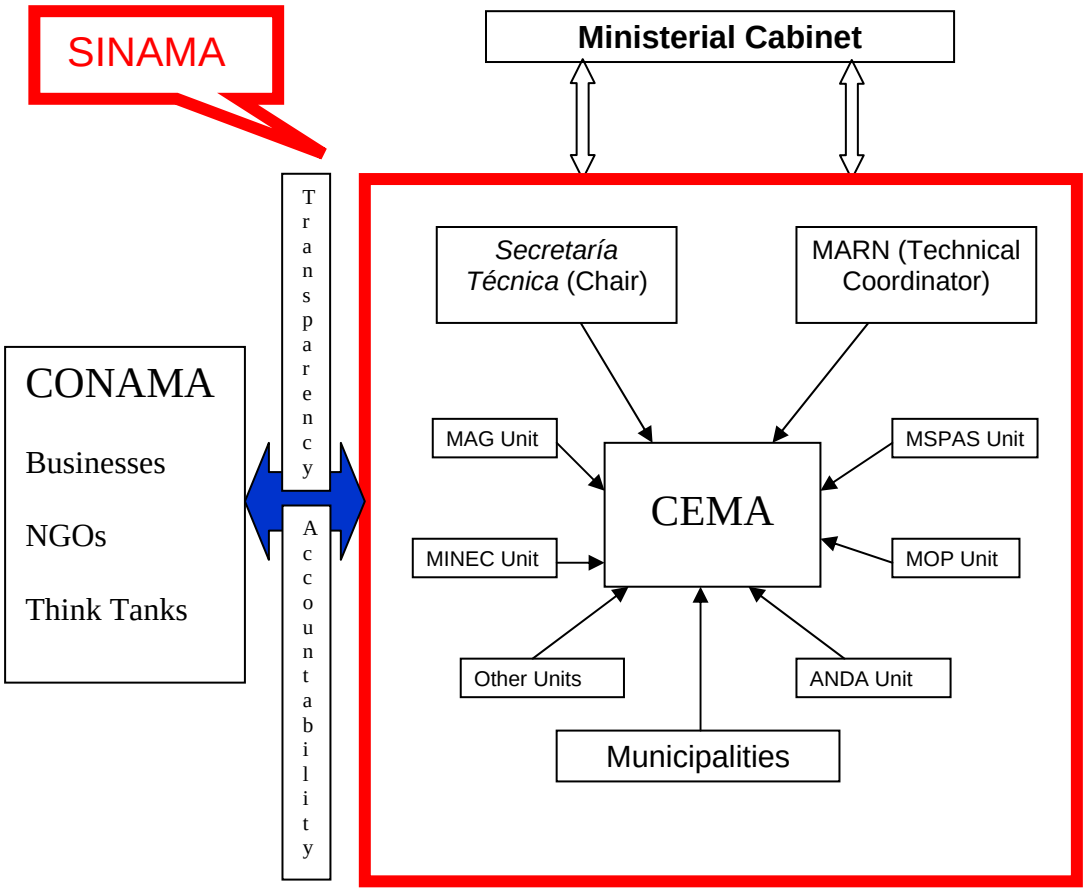
- Formalizing, via decree, the role of CEMA as the operational body of SINAMA, defining the policy decision-making process within CEMA,[7] including the consultation process between CEMA and CONAMA, and the functions and responsibilities of MARN as technical coordinator, including:

[6] Decree 40 of September 29, 2004.
[7] Colombia's National Environmental System (SINA), which includes the National Environmental Committee and the Advisory Regulatory Council, could be considered as a useful precedent.

    - Formulating the country's environmental policy.
    - Preparing the agenda and follow-up of CEMA monthly (or bimonthly) meetings and CONAMA meetings.
    - Providing effective mechanisms to assure information flow among the members of CEMA and CONAMA.
    - Tracking, reporting, and informing on decisions of CEMA (CONAMA is only an advisory body).
    - Drafting an annual report of CEMA and CONAMA activities to be endorsed by these respective bodies.
    - Ensuring public transparency through disclosure procedures of the workings of these bodies, particularly agendas of meetings, advice provided by CONAMA, and deliberations of CEMA.
- Formalizing the role of CONAMA via decree to serve as an advisory board for policy and regulation not only to MARN, but to CEMA as the operational body of SINAMA.
- Supporting the coordination role of CEMA by MARN with the convening power of the Secretaría Técnica to chair efforts for policy development and implementation. Consideration could be given to appointing a special advisor or coordinator for environmental policy within the Secretaría Técnica to assist the Secretario Técnico as chair of CEMA, and to providing a strong convening power jointly with the Minister of MARN on its role as Coordinator of CEMA.
- Encouraging MARN to develop and drive agendas appealing to sectoral ministries, such as on cleaner production for the Ministry of Economy (MINEC) or on energy efficiency for CEL.[8]
- Establishing or strengthening environmental units in the Ministry of Health and Public Assistance (MSPAS), the Ministry of Agriculture (MAG), MINEC, the new Tourism Ministry, and major municipalities.
- Ensuring that, in practice, the functions of existing environmental units (UAs) are broadened from obtaining environmental permits to actively mainstreaming environmental management within each agency.

[8] This "sectoral agenda" strategy has been followed by Mexico and Colombia with significant success.

Figure 1: Key Elements of the Organizational Proposal for Strengthening the National Environmental Management System



5.1.2 The Need to Clarify Priorities, Establish Quantitative Goals for Each Priority, and Assign Resources Accordingly

El Salvador has developed a number of environmental policies at the national level and on specific issues, helping to raise the profile of environmental issues in the national debate and the public administration, and providing a sense of accountability. However, through time, the increasing number of "priorities" and policies has blurred the focus on key concerns and attainable objectives. This "priority" inflation is particularly damaging in light of the low allocation of the national budget to environmental issues and the concentration of resources on a single instrument—the EIA—inside MARN. Moreover, the budgetary structure does not permit proper follow-up of the current efforts across the whole government. The Ministry appears to be caught under the burden of its daily tasks, without a clear sense of priorities for responding to current and potential environmental challenges.

Based on the above recommendations to improve institutional coordination and functioning of the National Environmental Management System, this report recommends that the government review the national priorities for environmental protection,

sequencing them and providing an appropriate budget to achieve them. The organization and resources allocation of MARN should reflect these priorities. Specific recommendations include:

- Establishing national environmental priorities with quantitative goals. Priorities and goals should reflect major environmental problems and potential environmental pressures associated with increased trade and infrastructure linked to DR-CAFTA. Among these priorities, the following have been identified by recent studies (Panayotou 1998; Strukova 2005):
    - Increasing regulatory compliance.
    - Water quality and quantity.
    - Air pollution (urban air pollution and indoor air pollution in rural areas).
    - Soil erosion.
    - Solid and hazardous waste management.
- Reflecting the stated priorities in the national budget allocation for environmental protection nationally, and developing a "whole of government" accounting system to monitor the use of budgetary resources. Where needed, reassign financial resources and personnel and provide additional sustainable funding, for instance, to tackle environmental health problems related to water quality.
- Reforming MARN's organization, balancing the preeminence of the EIA focus inside the Ministry with reforming of the instrument (see recommendation 5.2), and developing specific mandates, capacities, and staff to monitor and achieve the new priorities.[9]

5.2 Improve Effectiveness and Efficiency of the EIA System

Like other countries of the region, El Salvador has relied almost exclusively on the EIA as the main tool to develop its environmental management capacity. Currently, in El Salvador, an EIA is required for an open-ended list of activities, and basic standards are absent for facilitating the determination of applicable requirements. Many activities—some of them with standard and predictable impacts—are required to prepare an EIA, and consequently contribute to the serious MARN backlog in licensing. As a result, the process has become a bottleneck for projects. In addition, monitoring and control of the actual impacts of projects in their operation is limited because of the focus on an ex ante tool like EIA without a strong inspection system. Moreover, the new context triggered by DR-CAFTA and the government's very ambitious infrastructure program means that an urgent effort is required.

[9] Currently, most of the resources and attention of the Environmental Management Directorate focus on managing the EIA system.

Box 2: Establishing an Environmental Impact Assessment Task Force

It is of high priority that El Salvador reduce the backlog of existing EIAs and improve the EIA mechanisms and processes in order to use this tool in an effective and efficient way. An Environmental Impact (EI) Task Force could be established to design a process for eliminating the backlog in the next few months and for improving the EIA system. Its mandate and capacities might include:

- Developing, for existing and forthcoming EIAs, a targeted authorization process based on categorizations and standards, and complementary guidelines.
- Determining the steps to efficiently, effectively, and transparently eliminate the existing backlog of EIAs.
- Establishing a short-term EIA Reform Implementation Group (supervised by the Task Force) to carry out the following tasks:
  (i) Reviewing existing EIAs and eliminating the backlog,
  (ii) Developing a website where all the proposed EIAs and accepted EIAs (purged of industrial property information) are posted, and
  (iii) Implementing the reforms recommended by the EI Task Force to improve the EIA process for forthcoming EIAs.
- Undertaking and reporting on the implementation of a Strategic Environmental Assessment project.
- Providing assistance and guidance to businesses.

The EIA Task Force could be composed of three or four professionals to redesign the EIA process within a one-month period, and the EIA Reform Implementation Group might include 10 professionals to eliminate the backlog within a year.

This report recommends that MARN resolve the backlog and reform the EIA process under a targeting approach involving key agencies and private-public partnerships. Measures to improve this tool may include:

- Establishing an Environmental Impact Assessment Task Force under MARN to undertake the reforms (Box 2).
- Introducing a special program to eliminate in the next six months the existing backlog of pending EIAs.
- Reforming the approval process for existing (backlogged) and future EIAs based on an explicit categorization of activities that require an EIA to be assessed and approved by MARN, as follows:
  - Activities that require an EIA to be assessed and approved by a competent environmental unit under the strict guidance and supervision of MARN (see Box 2).
  - Activities that require MARN to be notified and that follow risk mitigation technical standards. Such standards could make explicit the technical requirements, emission limits, and similar instruments,[10] and the activities could be assessed by certified private entities to ensure they conform to the standards.
  - Activities that do not require EIAs (that is, all activities not listed).
- Adopting detailed guidelines for project proponents in preparing EIAs (to complement case-by-case TORs), and adopting detailed criteria for MARN in reviewing EIAs and granting environmental permits.
- Reinforcing the capacities of the MOP and ANDA units to decentralize some authorization powers under MARN's oversight. This oversight could be based on

[10] An example is NSO 75.04.11:03 Productos de Petróleo Estaciones de Servicio [Gasolineras] y Tanques para Consumo Privado. Especificaciones Técnicas, which established the requirements for gas stations.

random ex post inspection of the units' environmental permits and a periodic audit by MARN of the units' capacities and processes.

- Launching a pilot Strategic Environmental Assessment (SEA) project to develop this instrument as a complement to the EIA process, and selecting pilot sectors or regions of the country.
- Complementing the EIA adjustment and SEA implementation with technical guidelines and norms such as contract specifications, and with guidelines to mainstream design and environmental management best practices.

5.3 Compliance with Environmental Regulations through Enhancement of Inspection and Enforcement Capacities

Although the creation of the Inspectoría[11] is an important step forward, enforcement is one of the weakest aspects of El Salvador's environmental management framework. Due to DR-CAFTA, enforcement is one of the most sensitive issues. This is particularly relevant for compliance issues, which are likely to increase since pressure from trading partners might rise rapidly, as has happened in other free trade agreements. In addition, exporters will further demand better sanitation certification technology and capacity to guarantee market access. Many of the components of an effective enforcement system are already in place and will have an impact (that is, access to proceedings, review, and the courts, citizen complaints, the recently created Inspectoría, and the special environmental areas of the Fiscalía[12] and the National Civil Police, [PNC]), but human, material, and technical resources for enforcement activities (particularly inspections) need to be secured.

More substantially, the focus needs to be shifted from trying to change behavior by threatening with sanctions that are ultimately not enforced, to promoting compliance through achievable requirements that are applied gradually and with flexibility, but with credible sanctions for violators. Improving the legal framework with more precise regulations and standards (as indicated in the previous recommendations) will make compliance and enforcement easier, but those reforms have to take into account compliance from the outset to avoid creating unenforceable requirements. Improving compliance will require time and numerous reforms. An abrupt increase in enforcement without adequate reengineering of the compliance system might seriously affect competitiveness and/or drive businesses toward the informal sector without achieving environmental protection goals.

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[11] MARN created the *Inspectoría* in early 2005 to ensure compliance with environmental law. The core idea for this new unit is to strengthen enforcement and compliance through random or programmed inspections. This inspection will replace the current practice of inspecting facilities only in response to citizen complaints.

[12] The Attorney General of the Republic (*Fiscalía General de la República*) investigates and prosecutes crimes. The Fiscalía investigates environmental crimes through its environmental units, and may assist MARN in collecting fines or penalties. The Fiscalía has facilities in four regions throughout El Salvador. The regions and their 13 subregions do not necessarily coincide with the department subdivision, but rather with the particulars needs. The Fiscalía has a small Environmental Unit in each of the four main regions (San Miguel, San Vicente, Santana, and San Salvador).

This report recommends that MARN refocus the enforcement strategy around a Compliance Promotion Program, and through a combination of initiatives and strong monitoring that combines information, technical assistance, financial incentives, and a credible enforcement threat. Some of the key ingredients of such a program are:

- Establishing a Compliance Promotion Program monitored periodically by CEMA to bring the regulated community—including municipalities and other government entities—into compliance. The program might be based on the provision of information and technical assistance, financial incentives, and a credible enforcement threat, and might include an inspection program for unlicensed facilities and a follow-up and audit program for environmental management and environmental adjustment (adecuación) plans of licensed facilities. The Acuerdos de Cooperación Ambiental para la Competitividad currently under development may be incorporated into this program.
- Staffing, training, and equipping the Inspectoría of MARN and strengthening the capacity of the Fiscalía and the PNC.
- Establishing coordination through CEMA and information-sharing protocols between the Inspectoría and the inspection and enforcement departments of other ministries with environmentally relevant functions—ANDA, MAG, MOP, MSPAS, and municipalities. Outcomes of these mechanisms might be reported periodically to CEMA.
- Launching an aggressive sanitary and phytosanitary program to develop standards and to promote private certifying laboratories. Consideration should be given to harmonizing standards with those of countries like Colombia or Mexico to avoid costly redundancy of effort in developing standards.
- Ensuring availability of laboratories to support inspections and evidence gathering by the Inspectoría and the PNC.[13]
- Promoting the creation of independent environmental certification and auditing entities to foster third-party verification in support of government enforcement and voluntary compliance.

5.4 Better Support for Environmental Decision Making and Monitoring through Improving the Environmental Information System (SIA) and Public Participation

Environmental information is available at MARN and through its website. However, a system for gathering data on environmental quality periodically and in a format consistent with other national, regional, and international database systems is not yet in place.

This report recommends that MARN revitalize the SIA, which could provide relevant environmental information to support decision making, environmental policy

[13] The *Centro Nacional de Tecnología Agropecuaria y Forestal* (CENTA), under MAG, has a laboratory with qualified people that is open 24 hours a day and is underused, but would be able to perform the analyses required for environmental cases if supplies for this type of analyses were made available.

implementation, and performance monitoring throughout SINAMA and to stakeholders and the general public. Some of the key ingredients of such a program are:

- Developing SIA indicators to be used by government officials to steer policy priorities, for instance, concerning water balances, registry of users, and point sources of pollution.
- Consolidating the SIA by acquiring equipment, adding staff, and providing training, as needed. If appropriate, consider building on National Service of Territorial Studies (SNET) capabilities.
- Improving current water and air-quality monitoring.
- Creating an inventory of wastewater discharges and point-source air emissions.
- Developing a monitoring system to track information on environmental performance of major industrial facilities. Consider publishing the updated data on the SIA website.
- Integrating into the SIA the information already available and regularly received at the Ministry and other government agencies, including studies, professional experience, permit applications, and citizen complaints.
- Launching a systematic, periodic survey of the costs of compliance with environmental laws and regulations to better calibrate the gradual increase in environmental standards and enforcement capacities. The survey could in particular monitor the trade dimensions (that is, costs of exporting and importing) and the infrastructure development aspects.

In El Salvador, the environment is one of the most transparent, open, and accountable sectors. The LMA calls for public consultations on environmental policies and EIAs; the government has created CONAMA, which includes representatives of stakeholders and the public to advise the Minister of Environment on environmental policies, and MARN has a successful citizen complaints mechanism. Nevertheless, transparency and participation still have gaps and weaknesses that need to be addressed. For example, stakeholder participation mechanisms could be made more accountable, transparent, and balanced, particularly with regard to policymaking, EIAs, and draft laws, regulations, and norms. Equity and balance are also an issue: while the private sector has considerable lobbying capacity, participation of nongovernmental organizations (NGOs) and the general public in setting priorities and in rulemaking is less frequent and effective. In addition, lack of follow-up appears to be a generalized problem in consultations with stakeholders, NGOs, and citizens.

This report recommends that the government strengthen the current participation mechanisms with a clearer set of objectives, mandates, rights, and obligations by drafting regulations for the LMA to provide CONAMA with a renewed mandate, rights, and obligations. These may include:

- Introducing public consultation on all draft policies and legal measures (laws, regulations, and norms) with impact on the environment. The consultation period should be at least 15 working days.

- Public disclosure of opinion on the annual reports of MARN, CEMA, and the environmental units of ministries.
- Public disclosure of CONAMA opinions within 90 days of receipt by the above-mentioned bodies.
- Issuing an annual report on the state of the environment.
- Improving consultation mechanisms on proposed policies, laws, regulations, and norms, by organizing workshops or target groups to discuss proposals.

5.5 Addressing Medium- and Long-term Legal and Regulatory Gaps

The National Environment Law of 1998 (LMA) established a broad basis for building a regulatory framework that might address El Salvador's priority environmental problems. Coherence of the general legal framework must be ensured. The legal framework relies too heavily on command-and-control instruments, including sanctions, as a response to violations, while economic incentives instruments to promote compliance and achieve the desired conduct are not yet in place. Although some key regulations and technical standards have been adopted, legal thresholds have not been set for key issues such as wastewater discharges and air emissions. A framework for sustainable water management is still lacking, despite this being one of the most pressing natural resources issues facing the country. Compliance with the law and MARN's ability to implement and enforce it would improve with a legal framework that takes into account both the regulated community's ability to comply and the government's ability to oversee compliance and enforce the law.

While substantial progress on environmental management can be made by refining and updating regulations and bylaws in the medium to long term, there is a need for additional more detailed and complete legal proceedings, which require longer periods of negotiation and consensus building across multiple stakeholders. They include:

- Completing the legal regime for sustainable water management and for effective water provision providers.
- Completing the legal framework for zoning and land use.
- Resolving the contradictions and ambiguities in the legal framework, particularly those among the LMA, the Health Code, and municipal laws with respect to water, waste disposal, air pollution, and EIAs.
- Developing the law on transparency.

5.6 Need for a Water Resources Management Framework

In El Salvador, the water management institutional framework is characterized by a high number of entities at the national, regional, and local levels; poor policy coordination; and overlapping responsibilities. The water resources sector itself suffers from weak accountability and lack of transparency. The existing Water Law was approved in 1981,[14]

[14] Integrated water resource management law (*Ley sobre gestión integrada de los recursos hídricos,* D. Ley N° 886, 2 de diciembre de 1981; D.O. No 221. Tomo 273, 2 de diciembre de 1981).

and there have been many attempts to update it, including a recent major effort. A proposed new law with many positive, modern aspects has been drafted with the participation of different entities of the central government (mainly MARN and ANDA).
Up to now, given the lack of a national policy on water resources management and development, the authorities have been mainly focused on sector users, particularly irrigation and water supply. Increasing demand for water, however, has resulted in increased competition for scarce water resources and rising conflicts among the different water-user sectors. In addition, stakeholders are rarely involved in the decision-making process regarding water resources management and water project preparation and implementation. Finally, the impacts upstream and downstream are often not adequately considered, reflecting the lack of an integrated approach and long-term planning among the authorities. Due to increasing scarcity, however, water resources are coming to the forefront of the political agenda.

This report recommends that the government assign priority to reducing the vulnerability of the nation to water issues through a new legal and institutional framework clarifying the roles and responsibilities of all key participants. Principles that may guide this reform process are:

- Centralizing under a single law the management of water resources under the responsibility of MARN. The Ministry, in particular, could set up a special unit in charge of short- and long-term policy. MARN could also be in charge of a centralized registry of water rights and concessions.
- Maintaining and improving the coordination between MARN and the Executive Hydroelectric Commission of Rio Lempa (CEL) working as a river basin that involves the Honduran and Guatemalan counterparts.
- Designing and introducing market-based instruments based on the “polluter pays” principles, particularly establishing pollution standards and pollution taxes and charges for water use to cover, at least, water management functions.
- Strengthening the capacities of departments and municipalities to enforce the legal requirements established under the water management and service providers laws.
- Promoting stakeholder participation by establishing a National Water Roundtable, under the CONAMA structure, to comment on and monitor the application of all policy documents, and draft legal measures involving water resources.

I. Introduction

1. Background and Bank's Assistance

1.1 Background and Policy Challenge

Since emerging from a 12-year civil war in 1991, El Salvador has made remarkable progress in consolidating peace and democracy. The reestablishment of peace and the country's sustained economic reform efforts promoted an average annual rate of 4.9 percent in economic growth in the 1990s, after a decade of poor performance. Despite the country's impressive record of reforms and prudent macroeconomic policies, growth levels have slowed in recent years due in large part to external shocks. The new government's plan, "Safe Country 2004–2009," emphasizes inclusive economic growth and improved equity through expanding access to infrastructure.

Key pillars of this national development plan include trade promotion, through the Dominican Republic-Central American Free Trade Agreement (DR-CAFTA), and an ambitious program of infrastructure expansion. DR-CAFTA and the infrastructure expansion program represent both a challenge and an opportunity for environmental institutions in El Salvador. DR-CAFTA is expected to increase trade, investment, and economic growth, and improve the welfare of El Salvador's population. However, the extent of these gains will depend on El Salvador's capacity to implement complementary policies. The trade agreement by itself is unlikely to lead to substantial developmental gains without parallel improvements in areas such as infrastructure, trade facilitation, institutional and regulatory reform, education, and environmental management.

El Salvador faces severe environmental degradation of its natural resources, especially its natural forests, soil, air quality, and water resources. In El Salvador, only 2 percent of natural forests remain, which in the region compares only with Haiti. On the positive side, there is evidence of a significant recovery of secondary forests and biodiversity, as reported by ongoing studies (Hecht and others 2005). Water availability of 1,600 cubic meters per year (m^3/year)[15] for human consumption and productive activities is increasingly critical, generating severe water shortages, constraining economic activity, and generating conflicts among users. The health impact of environmental degradation has been estimated at around 2.5 percent of gross domestic product (GDP) (Panayotou 1998; Strukova 2005), of which inadequate water and sanitation services, poor hygiene, and ambient and indoor air pollution constitute the highest costs.

These problems compromise El Salvador's long-term economic growth, impose significant socioeconomic costs (particularly for vulnerable groups such as poor children), and have created a growing unmet demand in urban areas for adequate water supply, sanitation services, wastewater treatment, and clean and efficient public transport. At the same time, however, the country needs to improve competitiveness and promote investment to generate much-needed economic growth to alleviate poverty and improve human welfare. From an environmental policy perspective, the challenge is to strengthen

[15] Countries that have a per capita availability of water below 1,700 m^3/year are classified as being under water stress.

environmental institutions and policies so that they effectively protect the environment and the country's natural heritage (avoiding unrealistic regulations that might hinder competitiveness and investment) while supporting trade-driven growth and a much-needed expansion in infrastructure.

1.2 Development Plan and Bank's Assistance

Major economic reforms in the 1990s helped spur El Salvador's 4.9 percent annual average growth in GDP between 1991 and 2000.[16] Since then, however, growth has slowed to an average of only 2 percent, with negative impacts on per capita incomes and social indicators such as child nutrition. In response, the government launched "Safe Country 2004–2009," a national development plan based on three main goals: (a) accelerating economic growth and increasing employment, (b) building human capital and expanding access to infrastructure, and (c) enhancing security and reducing vulnerability. A major assumption of the plan is the adoption of DR-CAFTA, which the Salvadoran government is promoting vigorously since it is considered a key force for achieving sustained economic and social development.

To support the government's development plan, the World Bank's Country Assistance Strategy (CAS) for fiscal 2005–08 includes a strategic program of lending and nonlending services with a heavy emphasis on Development Policy Loans (DPLs) to support the government's economic growth and employment objectives. The first DPL, approved by the Board in fiscal 2005, focuses on improving the country's fiscal situation and generating resources for social spending. Future DPLs are expected to concentrate on trade facilitation, competitiveness, and infrastructure.

2. Rationale, Objectives, and Value Added

2.1 Rationale

Bank policy on Development Policy Lending (OP/BP 8.60) requires the Bank to determine whether specific country policies supported by the operation are likely to have significant impacts on the country's environment and natural resources. For policies with likely significant effects, 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 El Salvador, the expansion in trade and infrastructure expected from DR-CAFTA requires such an examination of the adequacy of country policies and institutional frameworks. One concern is the weak performance of El Salvador's environmental institutions, which lack adequate environmental information systems and have a poor record of including the public in decision making and ensuring proper regulatory enforcement. The CEA will identify a phased approach to fill these gaps and build capacity.

[16] The reforms include trade liberalization, dollarization, tax reform, financial sector strengthening, pension reforms, and private participation in telecommunications and energy.

2.2 Objective

The objective of the Country Environmental Analysis (CEA) is to analyze the efficiency and effectiveness of El Salvador'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.

2.3 Value Added

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

The report also provides policy options and practical guidance for decisions related to the expansion of trade and foreign direct investment (FDI). This is particularly relevant for El Salvador because some of the country's primary exports are water intensive, and increased productive activity in those sectors could lead to allocation conflicts, greater pollution, and heavy stress on environmental quality and resources (particularly in the absence of adequate regulatory enforcement and sufficient information on environmental costs).

2.4 Organization of this Country Environmental Analysis

Section I of the CEA describes the country's main environmental policy challenge, the Bank's assistance to El Salvador'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 El Salvador. Despite important progress in curbing environmental degradation, El Salvador still faces some serious environmental problems. For example, a study commissioned for this report estimated the health costs of environmental degradation at 2.5 percent of GDP.

Section III describes and analyzes the institutional (the rules of the game) and organizational (the players) frameworks and provides a benchmarking matrix, helping to underline the most important strengths and weaknesses. As part of the Bank's approach to preparing a CEA, this report devised a new analytical methodology to explore not only the basic institutional framework (policies, laws, regulations, instruments) in place, but also the organizational and human capacities to enforce them in an effective, efficient, transparent, and accountable way.[17] The synthesis of these two dimensions provides benchmarking elements disclosing key strengthens and weaknesses in the El Salvador framework.

[17] The process was based on an extensive review questionnaire approved by the government and a series of bilateral discussion with key stakeholders.

Section IV describes both the potential challenges and opportunities that the environment and natural resources in El Salvador may face as a consequence of DR-CAFTA and a very ambitious program of infrastructure expansion. The section aims to broaden the understanding of the environmental issues of DR-CAFTA in El Salvador by conducting a systematic analysis of trade and investment patterns. The analysis provides guidance on institutional strengthening as El Salvador continues to liberalize its trade and investment regime. Section IV also 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, avoiding, at the same time, unrealistic regulations that may hinder competitiveness and investment. The analysis benefited from workshops and meetings with both the environmental authorities and the authorities responsible for infrastructure projects (National Water and Sewerage Administration [ANDA], Executive Hydroelectric Commission of Rio Lempa [CEL], and Ministry of Public Works [MOP]).

Section V 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 El Salvador strengthen its institutional capacity in order to meet the environmental challenges that DR-CAFTA and the ambitious infrastructure expansion program will pose.

II. Key Environmental Issues and the Cost of Environmental Degradation

Managing El Salvador's fragile natural resources and protecting environmental quality is critical for the country's long-term economic growth and social progress.[18] 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 a very open economy trying to attract foreign investors and to bring the agricultural, industrial, and tourism sectors in line with more profitable markets. And yet, El Salvador faces severe environmental degradation problems, especially in the areas of environmental health and water resources. The following demographic and geographic features characterize the pressure that environmental resources face in El Salvador:

- A small territory of around 21,000 square kilometers.
- The highest population density in Latin America (approximately 310 people per square kilometer).
- A hilly topography (50 percent of total land mass has slopes of over 15 percent)
- Highly erodible soils.
- The lowest per capita availability of freshwater in Central America.

Despite substantial progress, environmental health problems are still enormous, according to a World Bank study commissioned for this report. Water pollution is one of the most pressing environmental problems that El Salvador faces. Inadequate quantity and quality of the potable water supply, sanitation facilities and practices, and hygiene conditions are associated with various illnesses in both adults and children, including schistosomiasis (bilharzia), intestinal worms, and diarrhea. While diarrhea is generally not as serious as some other waterborne illnesses, it is more common and affects a larger number of people, and thus constitutes the largest percentage of total health loss. Diarrheal morbidity dominates the cost of health impacts from inadequate water supply, sanitation, and hygiene. This is followed by diarrheal child mortality, hepatitis A, typhoid, and paratyphoid. Apart from access to clean water, sanitation and hygiene factors also influence child mortality. Larsen (2003) shows a statistically significant relationship between child mortality and access to improved water supply, safe sanitation, and female literacy. In El Salvador, poor access to water and sanitation, and lack of hygiene cause over 2 million diarrhea episodes and 500 deaths per year among children under age 5. The estimated health cost of waterborne diseases caused by poor water supply, sanitation, and hygiene amounts to 1 percent of GDP. Almost one-fifth of the population lacks access to an improved water source and around 40 percent do not have access to sanitation. Close to 95 percent of wastewater does not receive any kind of treatment before being released into water bodies; consequently, 90 percent of them are highly polluted.

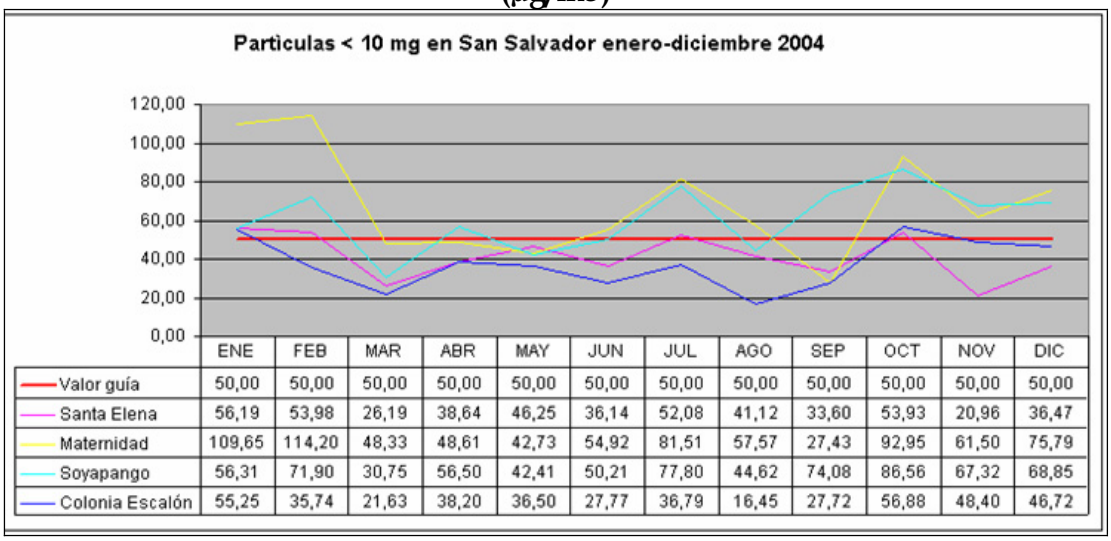
Despite commendable efforts to reduce outdoor air pollution, its associated high health costs, rapid urban growth, and an estimated 8 percent annual increase in an aging vehicle

[18] This section does not undertake to describe the state of the environment in El Salvador. Rather, it reports the cost estimates of the most important environmental problems in the country. For a description of the state of the environment, see MARN (2002) and UNEP (2004).

fleet (which is responsible for 70 percent of total air pollution) allow no room for complacency. Outdoor air pollution causes around 1,000 premature deaths per year (Strukova 2005), mainly among the adult population. In addition, acute respiratory illnesses (ARIs) are the main causes of morbidity. ARIs affected 28.5 percent of the population and they provoked 80 percent of medical visits during 2000–02. The health costs of air pollution were estimated at 0.90 percent of GDP.

Growth in the levels of particulate matter (PM) larger than about 10 micrometer in diameter (PM^{10}) is particularly worrisome. The annual average PM^{10} standard was exceeded in two measurement areas (out of four) in San Salvador in 2004 (Figure 2). The situation deteriorated in 2005 in all measurement areas and three of them exceeded the standard (Figure 3). This tendency could result in even higher mortality attributed to air pollution. The focus is on PM^{10} because recent scientific evidence shows that the best indicator of the health hazard of combustion smoke is small particles (Smith 2005). Particles larger than PM^{10} are deposited almost exclusively in the nose and throat, whereas particles smaller than 1 micro in size (PM^{1}) reach the lower regions of the lungs. Particles between 1 and 10 micros are deposited between the two extremes of the respiratory tract. The PM10 annual average standard in El Salvador is the same standard established by the United States Environmental Protection Agency (50 micrograms per cubic meter, [50 µg/m3]). However, based on recent studies, the World Health Organization has warned that even though there is no threshold in PM10 pollution, even lower levels could cause a substantial health impact if exposure is high.[19]

Figure 2: PM^{10} Concentrations in San Salvador, January–December 2004 (µg/m3)

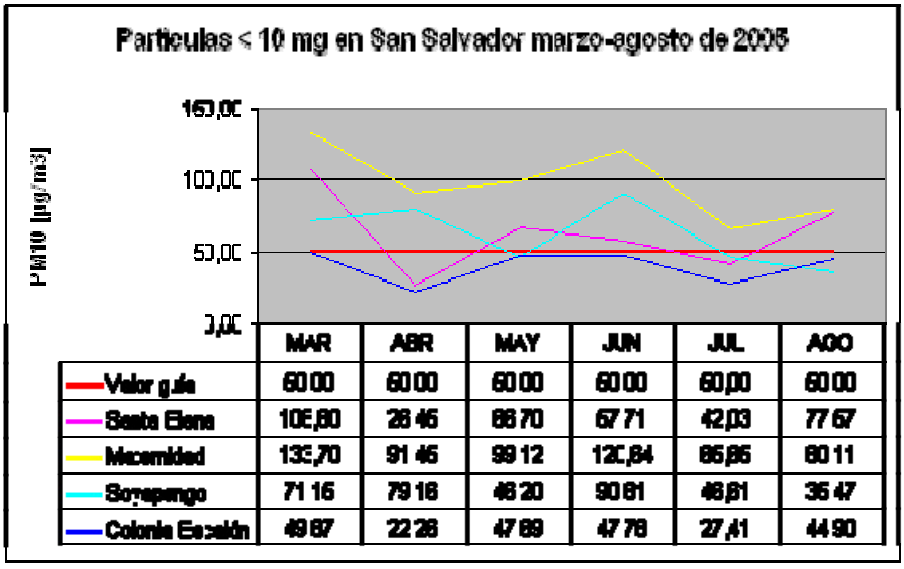


	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC
Valor guía	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00	50,00
Santa Elena	56,19	53,98	26,19	38,64	46,25	36,14	52,08	41,12	33,60	53,93	20,96	36,47
Maternidad	109,65	114,20	48,33	48,61	42,73	54,92	81,51	57,57	27,43	92,95	61,50	75,79
Soyapango	56,31	71,90	30,75	56,50	42,41	50,21	77,80	44,62	74,08	86,56	67,32	68,85
Colonia Escalón	55,25	35,74	21,63	38,20	36,50	27,77	36,79	16,45	27,72	56,88	48,40	46,72

Source: Unidad de Calidad del Aire, Ministerio de Medio Ambiente (2005).

[19] Based on this evidence, some European countries have established a lower PM^{10} annual average standard (30 µg/m3).

Figure 3: PM^{10} Concentrations in San Salvador, March–August 2005 (µg/m3)



Source: Unidad de Calidad del Aire, Ministerio de Medio Ambiente (2005).

$PM^{2.5}$ are not measured in El Salvador but their level can indirectly be estimated assuming a ratio of $PM^{2.5}$ to PM^{10}. This ratio varies from 0.15 to 0.96 for different pollution sources. Given that San Salvador's aging vehicle fleet is responsible for 70 percent of total air pollution, it is reasonable to assume that the majority of particulate matter (PM) corresponds to $PM^{2.5}$.

Table 1: Emission Sources: Ratio of PM2.5 and PM10

Emission Sources	PM2.5/PM10 Ratio
Stationary Sources	
Fuel combustion	0.96
Industrial Processes	0.56
Fugitive Dust Sources	
Paved road dust	0.25
Unpaved road dust	0.15
Construction and demolition	0.15
Farming operations (tilling, etc.)	0.20
Miscellaneous Processes	
Waste burning	0.96
Agricultural residue burning (Scarborough and others 2002)	0.93–0.96
Forest fires	0.93
Mobile Sources	
On-road	0.98

Source: Larsen (2005).

Indoor air pollution is also a source of concern, with 9 out of 10 rural households burning fuelwood and agricultural residues in inefficient stoves in poorly ventilated areas. Under adequate conditions, these fuels can be burned in a fairly clean way, producing mostly

carbon dioxide and water. However, such conditions are not met by the inefficient stoves used in poor rural areas and, therefore, the emissions of health-affecting pollutants are extremely high per unit of fuel. Unfortunately, these emissions are coupled with high exposure because they are produced in activities (cooking and heating) in close daily proximity to large populations. The exposures are higher in women and children and the health effects include: (a) pneumonia; (b) chronic bronchitis, emphysema, and other chronic obstructive pulmonary diseases; and (c) lung cancer (Smith 2005). Almost 2 million people in rural areas in El Salvador are exposed to high levels of indoor air pollution, resulting in 500 deaths (mainly among women and children) and close to 2.5 million cases of acute respiratory illnesses (like pneumonia) per year. The health costs of indoor air pollution were estimated at 0.85 percent of GDP.

Water is an extremely vulnerable resource in El Salvador, especially in light of increasing household, agricultural, and industrial demands (including hydroelectricity generation). In addition, on the supply side, despite having abundant rain, its skewed distribution throughout the year and inadequate conditions to store water and regulate its flow limit the availability of internal water resources to 2,755 cubic meters per person per year. In addition, land use change (for example, the urbanization of aquifer recharge areas) and pollution are further decreasing the availability of water. According to the Central American Commission for Environment and Development (Comisión Centroamericana de Ambiente y Desarrollo, CCAD) and the United Nations Environment Program (UNEP), "in general, there are large regional differences in the demand for water that create the conditions for future conflicts" (CCAD 2005). This pattern is particularly easy to appreciate in the case of the Metropolitan Areas of San Salvador (MASS). The majority of the population of El Salvador (and practically all the population growth) is concentrated in the MASS and in cities like San Miguel, Santa Ana, and Sonsonate. To meet the growing demand for water, San Salvador draws increasing amounts of water from the aquifer and, at the same time, there is evidence of a systematic loss of recharge areas on the outskirts of the eastern side of the San Salvador Volcano because of uncontrolled urban growth. Consequently, the level of the San Salvador Aquifer is descending at a rate of 1 meter per year and water is being diverted from the Lempa River to meet San Salvador's demand. Other important aquifers, like El Playón, are also being overexploited.

Both human activities and natural conditions contribute to an extremely high annual erosion rate (59 million tons of soil, equivalent to a land mass of 45.4 square kilometers 1 meter deep). Almost half of the land has slopes greater than 15 percent and torrential rains are not uncommon. However, the erosion mainly results from human activities, especially inadequate land use, such as agricultural frontier expansion into hilly areas without proper erosion-control methods. Erosion has several negative impacts. It reduces aquifer recharge, lowers agricultural productivity, and increases sedimentation of hydroelectric reservoirs and other water bodies. The annual cost of erosion is estimated at 0.8 percent of GDP (Strukova 2005).

Natural forests have largely disappeared due to the large population density and the expansion of the agricultural frontier. Deforestation has constantly been mentioned as one of the country's main environmental problems. According to Panayotou, "Natural forest cover is down to 2 percent of the country's land area, one of the lowest in the world, and

is clearly inadequate to maintain ecological stability" (Panayotou 1998). Along the same line, the CCAD and UNEP Environmental Outlook for Central America 2004 states that: "Given the intense human occupation since ancient times, combined with the largest demographic density in the isthmus, the substitution of forests by shrubs and bushes is well advanced in El Salvador, a process that leads to desertification and that is especially evident in the drier valleys and mountain skirts of the north and the west of the country" (CCAD 2005).[20] However, new evidence appears to show that reforestation is taking place, that relatively dense forests cover 60 percent of the country, and that the forest cover grew almost 40 percent during 1992–2001 (see Box 3) (Hecht and others 2005).

Box 3: The Secret Forests of El Salvador

"Previous studies have concentrated on the small remnants of what they viewed as primary forests. They have largely overlooked shaded coffee and orchards, hedge rows, urban tree cover, and forests regenerating in abandoned pastures. Yet these areas provide food and shelter for many of El Salvador's 520 species of birds, 121 mammals, and 130 reptiles and amphibians, and they also protect watersheds and supply forest products. Moreover, most of the so-called primary forest probably is not. Practically all of this tiny country has been profoundly altered by people for centuries.

"Several factors helped make the country greener in the last twenty years. The civil war in the 1980s pushed people out of rural areas, allowing the trees to grow back. It also kept farmers from investing in coffee systems with less shade, as they did in other parts of Central America. Over two million people fled the country and started sending money to those who stayed behind. Those that received the money could have used it to farm larger areas, but policies favoring cheap food imports made it less attractive to grow crops. So, many of them abandoned their fields and lived off their remittances instead. Low prices, land reform, and a lack of subsidized credit discouraged large-scale farming. While the country remains densely populated, it now has a lot more trees."

Source: POLEX: CIFOR's Forest Policy Expert List server; based on Hecht and others (2005).

El Salvador is vulnerable to many different natural disasters as a consequence of both geographical and socioeconomic factors. According to the National Service of Territorial Studies (Servicio Nacional de Estudios Territoriales, SNET), around 10 percent of the country is exposed to floods, approximately 20 percent is prone to landslides, 50 percent can be affected by drought, and almost 75 percent of the country can be affected by earthquakes. Natural disasters kill people, damage infrastructure, and affect development. Table 2 shows the substantial economic cost associated to recent natural disasters in El Salvador. Poor people are particularly hit by natural disasters because they are more likely to live in dangerous areas, such as flood plains, river banks, steep slopes, and fragile buildings in densely populated settlements.

[20] The text in Spanish reads: "Dada la intensa ocupación humana desde tiempos antiguos, combinada con la mayor concentración demográfica del istmo, en El Salvador se encuentra en extremo avanzada la sustitución de formaciones boscosas por arbustos y matorrales, proceso tendiente a la desertificación y evidente sobre todo en los valles y estribaciones submontanas más secos del norte y occidente del país."

Table 2: Economic Cost of Recent Natural Disasters

Disaster	Economic Cost (as percentage of GDP)
El Niño (1997–1998)	1.6
Hurricane Mitch (1998)	3.0
Earthquakes (2001)	12.0
Drought (2001)	1.2

Source: SNET (2004).

Natural resources mismanagement may increase a country's vulnerability to natural disasters. For example, given the mountainous nature of the country, deforestation in areas of abundant rainfall accelerates erosion, nutrient loss, and sedimentation, which in turn impact the number and intensity of floods, landslides, and droughts (MARN 2004). The Framework for the Reduction of Vulnerabilities to Natural Disasters in Central America, promulgated by the presidents of all the countries in the region in 1999, recognizes that environmental and natural resources management is essential to a successful vulnerability-reduction policy. The fact that MARN, through SNET, is responsible for the national policy of risk prevention and reduction, further emphasizes the importance that the Government of El Salvador ascribes to environmental and natural resources management to reduce the country's vulnerability.

DR-CAFTA and a very ambitious infrastructure program represent both a challenge and an opportunity for environmental institutions in El Salvador. DR-CAFTA is expected to increase trade, investment, and economic growth, and improve the welfare of El Salvador's population (including the poor). However, the extent of these gains and net benefits from DR-CAFTA will depend on El Salvador's capacity to implement complementary policies. The agreement by itself is unlikely to lead to substantial developmental gains without parallel improvements in areas such as infrastructure, trade facilitation, institutional and regulatory reform, and 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 Salvadorian institutions ready to meet that challenge? What are the institutional gaps and what can be done to fill them?

III. Institutional and Organizational Analysis

To face its environmental challenges, El Salvador requires effective and efficient environmental policies, laws, and organizations to implement them.[21] This section focuses on the existing institutional situation, followed by an analysis of the current key players interacting with this institutional setting. It concludes with a synthesis of the strengths and weaknesses and a benchmarking exercise the purpose of which is to outline the key avenues for actions.

1. Institutional Framework (the Rules of the Game)

El Salvador finished the decade of the 1990s with a brand new institutional framework to tackle environmental problems. It comprises policies, laws, and regulations, and a series of instruments and procedures.

1.1 Environmental Policies

Governments must be clear about why they intervene, about the principles and objectives of their actions, and about the responsibilities of the groups involved in the design, implementation, and enforcement of their interventions. Adoption of an environmental policy that has been endorsed by the current government can be an effective way to meet these conditions. Communication to the public of the need for regulatory reform is essential to sustaining support. Even before the establishment of the current legal regime, there was an environmental policy in El Salvador. Since then, the policies have expanded and gained a higher profile.

The 1998 National Environment Law (LMA) entrusts the Council of Ministers with the country's environmental policy, including principles, plans, and actions, and updating it at least every five years.[22] In practice, though, there are two sets of policy documents defining the government environmental policy priorities: the 2000 Política Nacional del Medio Ambiente y Lineamientos Estratégicos, which has not been formally replaced by a new policy, and the environmental chapter entitled, "Environment: Legacy for Future Generations," of the government plan, País Seguro 2004–2009 (Safe Country 2004–2009), which establishes the strategy of the current administration.

The Política Nacional del Medio Ambiente y Lineamientos Estratégicos adopted in 2000 is based on three overarching principles, which are set out in the LMA: Dynamic Equilibrium, Shared Responsibility, and Social Interest. Policy guidelines are derived from these principles under two broad categories: (a) conservation and use of natural resources, which includes land use planning, biological diversity, and forests; and (b) environmental management, which comprises the legal, institutional, and economic

[21] The 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 organizations, the report focuses on the key actors influencing environmental institutions, which includes the key entities, bodies, and "bureaucracies" in charge of developing, applying, and enforcing the institutional framework.

[22] Article 3 of the LMA.

framework, a gender equity approach, environmental education, social participation, and pollution prevention and control.

The current government's environmental priorities that have been established by the Minister of Environment's office according to the Safe Country 2004–2009 plan focus on three areas:

- Natural Resources Conservation, comprising: (a) stopping and reversing deterioration of natural resources, (b) reforestation, (c) sustainable management of natural resources, and (d) an ecosystems approach to biodiversity;
- Integrated Management of Water Resources, comprising: (a) establishing a new legal and institutional framework; (b) conservation, management, and monitoring of water resources; and (c) sustainable use of water; and
- Integrated Management of Solid Wastes, comprising: (a) pollution prevention and control, (b) integrated management of solid wastes, and (c) a legal framework for dealing with toxic substances.

In addition to the National Environmental Policy required by the LMA, the government has developed the following specific policies and strategies in the past few years: a Solid Waste Policy, a Policy to Combat Desertification, a Policy on Natural Protected Areas, a Policy for the Sustainability of Water Resources, Policy Guidelines on Access to Genetic Resources Related to Wildlife, Procedures for the Participation by Civil Society in Managing Natural Protected Areas, and Technical Procedures for Biodiversity Inventories.

Interestingly, the LMA requires that government policies, plans, and programs be subject to Strategic Environmental Assessments (SEAs) to minimize negative impacts on the environment and ensure consistency with national environmental policy (see Box 4). Although efforts are underway to establish them, SEAs are yet to be carried out in practice.

General assessment of the policy framework. There is no doubt that the development of a policy framework indicates that environmental issues have risen in the national debate and functioning of the public administration. Despite this achievement, however, the policy statements are so general and all-encompassing that in practice they do not provide sufficient direction and focus to government efforts. MARN officials and other government personnel involved with environmental matters have stated that they do not have a clear understanding of what the priorities and goals are.

Furthermore, El Salvador has suffered from a sprawling agenda in which new priorities incessantly accumulate without a clear filtering mechanism, and compete with each other for scarce attention and resources. Consequently, there is a clear risk that "good intentions" inflation may blur a sense of priorities and sequencing. In that sense, a clearer definition of national priorities for environmental protection, and a justification of priorities, would provide a greater sense of direction. Specific quantitative goals and an understanding of the connection between stated environmental policy and the specific tasks carried out at MARN would also improve effectiveness of environmental protection activities. MARN has made progress in reporting on some environmental indicators

(through the water quality index, air quality data, and biodiversity listings), but these indicators are not yet matched to the stated priorities.

Box 4:The Role and Practice of Strategic Environmental Assessments

The Strategic Environmental Assessment (SEA) extends the application of Environmental Impact Assessments (EIA) from projects to policies, programs, and plans (PPPs). SEAs aim to improve the strategic decision-making processes of PPPs by integrating environmental considerations into their decision-making processes. SEAs can be a powerful tool to efficiently and effectively address the environmental implications of infrastructure expansion because: (a) including environmental costs and benefits alongside economic, social, and political concerns allows government authorities to make a more informed decision; (b) including environmental considerations in the decision-making process offers the opportunity to influence the kinds of projects that will be implemented; (c) SEAs may lower the subsequent compliance costs of individual projects and have the potential to streamline inefficient environmental licensing processes; and (d) analyzing PPPs (rather than isolated projects) facilitates the consideration of cumulative and synergistic impacts of multiple projects.

Article 17 of El Salvador's National Environment Law (LMA) mandates that SEAs be conducted to evaluate the environmental impacts resulting from the government's PPPs, and Article 16 of the General Regulations of the law enumerates the components of an SEA. Despite this legal foundation, SEAs have rarely been used in El Salvador. The relative novelty of the instrument, lack of established methodologies, and a shortage of successful applications in countries with similar socioeconomic and environmental conditions, among other reasons, may explain their rare use. However, conditions have changed; SEAs are regularly applied in both developed and developing countries, there is a wealth of established methodologies, several Latin American countries have used them successfully, and, equally important, there is the perception that SEAs (and similar instruments, like a zoning law) are needed in El Salvador.

As part of the activities to produce this report, the Ministry of Environment and Natural Resources (MARN) and the World Bank organized a workshop on SEAs in San Salvador in order to: (a) disseminate the application of this tool, (b) obtain the participants' views on its relevance in El Salvador, (c) identify pilot applications, and (d) analyze how SEAs can be used to make the environmental impact evaluation process more effective and efficient. Participants included high-level decision makers and technical staff from MARN, the National Water and Sewage Administration (ANDA), the Ministry of Public Works (MOP), the Executive Hydroelectric Commission of Rio Lempa (CEL), and other agencies, and academics and representatives from the private sector and NGOs. The participants agreed on the need to use SEAs to reduce the transaction costs of improved environmental management and suggested the regional development plans based on the Carretera Longitudinal del Norte and Cutuco Port as good pilot applications.

1.2 Legal and Regulatory Framework

Today, El Salvador has an increasingly sophisticated system of laws and regulations. It includes four laws (the LMA, the Forestry Law, the Conservation of Wildlife Law, and the Natural Protected Areas Law), 8 regulations, and 24 municipal bylaws that address environmental issues directly or indirectly.

The 1998 LMA is the cornerstone of the system. It was enacted after thorough discussions and negotiations over several months, in which the private sector and NGOs participated (see Box 6).

The law presents general policy guidelines for both public and private institutions dealing with environmental issues. It sets out the roles and enforcement powers of MARN, the National Environmental Management System (SINAMA), and other government entities. Since enactment, the law has been amended only twice, and in only minor aspects, an indicator of the quality of its design.

The LMA provides a good general framework for regulating and managing environmental issues, including those related to pollution control and conservation. It articulates a set of ambitious principles of environmental policy, including the right of citizens to live in a healthy and ecologically balanced environment, the principle of sustainable development, shared social responsibility for the environment, a call to ending unsustainable consumption and production patterns, and the obligation to compensate for environmental damages. The law touches on practically all of the ideal elements of good environmental performance, such as: mainstreaming of environmental policies (by creating SINAMA); public participation in environmental management, gathering, and disseminating information; environmental education and development of technical and scientific knowledge; valuation of natural resources in national accounts; civil liability for environmental damage; and the responsibility of public servants.

The LMA also provides legal means for the adoption of an effective toolkit, including: Environmental Impact Assessments (EIAs), permits, standards, economic incentives and disincentives, emissions inventories, land use planning, and emergency preparedness that may be developed through special regulations and standards. Finally, the LMA includes progressive concepts like ecosystem management, and promotes an integrated management approach to natural resources conservation and use. This strongly principled and comprehensive base puts El Salvador in a good position to tailor specific tools and strategies to address its environmental priorities, although so far, as this section explains, efforts have focused on environmental permitting through the EIA/diagnostics process.

1.2.1 Complementary and Concurrent Environmental Laws

El Salvador also has a series of laws dealing directly or indirectly with environmental issues.[23] Following are the most important:

- The Forestry Law, administered by the Ministry of Agriculture (MAG), regulates the conservation, improvement, and restoration of forestry resources, emphasizing private sector participation. The law provides the regulatory and operational frameworks for the development of El Salvador's forestry industry, including conservation measures and commercialization procedures. This law also determines penalties and sanctions related to management and illegal commercial activities in the forestry sector.

- The Law of Natural Protected Areas, administered by MARN, determines the different types of natural protected areas that comprise the Sistema de Áreas Naturales Protegidas (ANP). It sets the criteria for establishing and managing these areas, describes the types of activities that can be carried out in an ANP, and defines mechanisms like payments for environmental services to promote their protection.

- The Law for the Conservation of Wildlife, administered by MARN, provides the framework for wildlife protection, management, and conservation, including

[23] In addition, the environmental role and responsibilities of the Ministries of Agriculture and Health, the water utility (that is, ANDA), and municipalities are outlined in their respective laws (see section III).

regulations on hunting, trapping, and commercialization. The law also contains a list of endangered species.

- The Health Code establishes the framework for developing health and environmental programs, including waste management measures and drinking water system maintenance projects. The Ministry of Public Health and Social Assistance (MSPAS) administers these provisions.
- The Law on the Control of Pesticides, Fertilizers, and other Products for Agricultural Use, administered by MAG, regulates the use, manufacturing, import, and transport of pesticides and other toxic substances destined for agricultural use. It also provides a list of violations related to this area, and their respective sanctions.
- The Irrigation and Drainage Law, also administered by MAG, regulates the conservation, sale, and distribution of water resources for agricultural purposes, and the construction and administration of irrigation and drainage projects.
- The Mining Law, administered by the Ministry of Economy (MINEC), regulates the exploration, exploitation, and commercialization of all mining activities in the country. It includes requirements for EIAs and effective waste management.
- The General Law on Electricity, administered by MINEC and the national electricity provider, CEL, regulates the generation, distribution, and commercialization of hydroelectric energy resources. It calls for the promotion of high environmental protection standards in the development of electrical activities.
- Although not a law, the Regulation on the Law of Urbanization and Construction, administered by the Ministry of Public Works (MOP), is also relevant to environmental matters because it establishes the requirements for obtaining construction permits and regulates the development of public service infrastructure.

Notwithstanding the general benefits brought by this framework, overlaps and contradictions apparently exist among these laws and regulations (see below). The main reason for the lack of coherence in the framework is arguably that some of these laws were enacted well before the LMA, but an analysis was not carried out when the LMA was adopted to identify conflicting provisions that needed to be derogated. Instead, the lawmakers relied on implicit derogation principles (a recent provision takes precedence over an older one, but a special law takes precedence over general laws, and so on) and on simply stating a blanket derogation of any provisions that contradict the law or its regulations, without identifying them individually. This aspect has tended to structurally weaken the overall coherence of laws and reduce legal security (that is, transparency).

The LMA is considered a specific law with precedence over provisions of other laws that may contradict it.[24] However, the generality of some LMA provisions often renders this preemption moot, which may then raise conflicts during their application and enforcement.

[24] According to article 115, the LMA is a “special” law and thus should have precedence over other laws.

There are an important number of contradictions with the Health Code. This law gives the MSPAS responsibility for developing environmental quality programs for water provision, waste disposal, air pollution, and so forth (art. 56 of the Health Code), which are all also the MARN's responsibilities. The Health Code also provides norms and powers under the MSPAS with respect to water control (arts. 61 to 65), wastes (arts. 74 to 78), urbanization and construction (art. 96 to 105), radioactive pollution (arts. 191 and 192), and so forth. In addition, the MSPAS is granted powers to sanction violations that conflict with MARN's own sanctioning powers.

Water management is among the clearest examples of conflicting jurisdictions. No single authority has the power and responsibility for ensuring the sustainable management of water and control over how the resource is distributed among competing users.[25] According to ANDA's law, human consumption is the priority use of water, but there are no mechanisms to enforce this provision. When water is used for irrigation or hydroelectric power, MAG, the energy regulator (CEL), and even municipalities are involved. At the same time, MARN is responsible for ensuring that water quality remains within the limits established in the technical norms, that wastewater is properly treated before its discharge, and that water reuse activities are not carried out without an environmental permit. The Law on Integrated Management of Water Resources (Ley Sobre Gestión Integrada de los Recursos Hídricos) and the Regulations on Water Quality, Control of Discharges and Protection Zones (Reglamento Sobre la Calidad del Agua, el Control de Vertidos y las Zonas de Protección), which predate the LMA but are formally still in effect, have not been implemented in practice.

A similar problem arises with the import of hazardous substances. To import nitrocellulose, for instance, a firm will need three separate permits: one from the Ministry of Defense, one from MARN, and one from the Public Health Council. Efforts to consolidate such redundant paperwork under a one-stop-shop (ventanilla única) have apparently been initiated but not yet put into effect, except in the investment promotion unit, Organismo Nacional de Inversión (ONI).

In the case of forestry oversight, some activities fall under several jurisdictions: logging and cutting trees is regulated under the Forestry Law, the Law of Natural Protected Areas, and the municipal authority per the Municipal Code, depending on where the tree falls. It is under MARN's jurisdiction when the tree falls in a natural protected area. It is the responsibility of municipalities when trees fall in a town and urban area. And, if the tree falls elsewhere, it is the responsibility of MAG. ANDA, however, has the authority under article 53 of its law to cut trees in carrying out its activities. Not surprisingly, these diverse protection efforts have led to confusion and serious difficulties in the development of a coherent national forestry policy, and for the individual who wishes to get a permit or file a complaint against a violation. As for requiring EIAs, municipalities may well grant permission to clear the land before MARN processes and completes the

[25] A proposal for a law on water is currently being prepared that would presumably establish a basin-based water management system. Consistent and in-depth participation by all the agencies concerned with water issues, like MAG and ANDA, will be fundamental to the success of the proposal in the Legislative Assembly and to its effective implementation.

EIA. Municipal construction laws do not make reference to the need for EIAs, and the sequence of this process with respect to other legal requirements is not clear.

1.2.2 Regulations and Technical Standards

Like in most countries, the LMA defers to explicit subordinated regulations developed and enacted by the government and the ministry together with other public bodies. Since the late 1990s, the government has prepared and published the following eight environmental regulations:

- General Regulation of the LMA. Provides further guidance on all of the main components of the LMA: SINAMA; public participation in environmental management; environmental policy instruments, including the EIA process, SEA, environmental information, incentives and disincentives, the Environment Fund of El Salvador (FONAES), science and technology, environmental education, and the national environmental strategy; pollution prevention and control, including air, ozone, climate change, water, soil, zoning, and pesticides; environmental risk and disasters; natural resources, including biodiversity and aquatic, marine, forest, land, and protected ecosystems; nonrenewable resources, including rock beds; and prevention, environmental liability, and the sanctioning process.
- Special Regulation on Control of Ozone-Depleting Substances. Establishes quotas and controls for the import and use of ozone-depleting substances.
- Special Regulation on Wastewater. Provides general guidelines on wastewater treatment and reuse, and established requirements for wastewater analyses and reporting, although it does not contain maximum permissible contaminant limits or other quantitative parameters.
- Special Regulation on Environmental Quality Norms. Establishes guidelines for technical environmental quality norms and sets some specific parameters for fixed-source air emissions and quality of bodies of water receiving discharges.
- Special Regulation on Hazardous Substances and Wastes. Regulates the registration and import of hazardous substances and the generation, transport, storage, final disposal, and export of hazardous wastes.
- Special Regulation on Integrated Solid Waste Management. Establishes general guidelines for storage, collection, transport, transfer stations, treatment, recycling, final disposal, and sanitary landfills.
- Special Regulation on Environmental Compensation. Regulates trust funds as a means of providing environmental compensation where required by law to redress environmental damages and for payments for environmental services.
- Regulation of the Forestry Law. Regulates logging on private and public lands and establishes requirements for forest management and prevention and control of fires and plagues.

These regulations vary in their degree of detail and are steps in the right direction, but few accomplish the purpose of clearly and definitively regulating a specific source of pollution or an element of the environmental management framework. For example, the

General Regulation of the LMA covers practically all the topics of the LMA, but again in a general manner, except perhaps, for the section on EIAs, which lays out the assessment process in detail. The Special Regulation on Hazardous Substances and Wastes and those on solid waste are comparatively more detailed. The Special Regulation on Technical Norms also sets some parameters, although it is still too general with respect to air emissions, water quality, and soil quality, and it has no provisions concerning noise pollution. Overall, the existing regulations do not seem to promote effective implementation of the law. Often, the regulations mostly restate what the law already provides for or they contain open-ended references like, "as provided for in the law, regulations and standards," rather than setting a specific rule or standard or referring to a specific article or other concrete norm, as would be expected from an instrument that is supposed to provide for the implementation of a measure.

The regulations are developed by substantive areas of MARN. As is the case for all measures in El Salvador, the practice of analyzing their potential impacts (positive or negative) and their budgetary implications has not yet been adopted. (See Box 5 on the use of Regulatory Impact Analysis). However, in some instances MARN has solicited comments from the private and social sectors.

The government has also developed some environmental technical standards (normas) related to the LMA and its regulations. Technical committees, in which MARN and representatives of other stakeholders take part, develop the normas under the umbrella of the Consejo Nacional de Ciencia y Tecnología (CONACYT).[26] The Ministry of Economy is in charge of approving the technical standards, which include voluntary norms—normas salvadoreñas recomendadas—and obligatory norms—normas salvadoreñas obligatorias. The LMA entrusts MARN with overseeing compliance with environmental technical standards, reviewing them periodically, and proposing reforms or updates in light of material and technological changes. The obligatory standards currently listed under "environment" are:

- Petroleum Products. Spent oil management (official).
- Water. Potable water (official status in progress).
- Bottled Water. (official).
- Water. Wastewater discharged into a receiving body (pending official status).
- Ice. Specifications and good practices for production (official).
- Ambient Air Quality. (official).
- Atmospheric Emissions. Fixed sources (pending official status).
- Atmospheric Emissions. Mobile sources (official).
- Solid, hazardous, and bio-infectious waste management. (official status in progress).

[26] CONACYT is an autonomous public entity responsible for promoting technological innovation and proposing technical standards for approval by the Ministry of Economy. Environmental norms and standards are drafted by CONACYT through technical committees that include representatives from the government, the public sector, academia, and professional service providers. (The catalogue of all norms is available on the Internet and directly from CONACYT, and the full text of the norms is for sale from CONACYT, though it is not always available.) CONACYT is also responsible for certifying laboratories, and is planning to promote private certified verification services.

General Assessment of the Legal and Regulatory Framework. Seven years after adoption of the LMA, El Salvador has developed the foundations for a modern environmental legal system. The framework is comprehensive and ambitious in addressing environmental protection and resource conservation issues. Law- and rulemakers have also gained experience in sorting opportunities and obstacles for achieving their numerous environmental policy goals. By the end of the 1990s, the country had:

- Adopted a National Environment Law (LMA) and regulations.
- Created a cabinet-level ministry for the environment (MARN).
- Designed a National Environmental Management System (SINAMA) to mainstream environmental considerations into sectoral policies.
- Introduced regional planning.
- Signed and ratified numerous international environmental agreements.[27]
- Strengthened social participation by consolidating a wide network of environmental organizations and introduced a system to collect and manage environmental complaints.
- Promoted environmental education by introducing environmental issues in programs and courses at all levels of the National Education System.

However, despite these many achievements, some important gaps remain. For instance, the legal framework does not include provisions for sustainable water management. Most of the regulations are still too general and key technical standards have not been adopted.[28] Moreover, overlaps between the LMA and other laws still exist, and some critics think that the LMA is too strict and "not gradual enough in its implementation" to ensure compliance. Implementation and application of the policies, laws, and regulations by MARN and other public entities are not supported by a flexible set of compliance promotion and enforcement mechanisms that could broaden the response options available to enforcement officers and help bring potential violators into compliance.

Reasons for these shortcomings are linked to the typical Salvadoran rulemaking processes and practices. Well-meaning efforts to adopt ambitious policy instruments inadvertently give insufficient consideration to the practical implications and costs of compliance and enforcement—both for the government and for businesses—and also fall short of an implementation strategy to make instruments effective on the ground.

Box 5: Tailoring the Legal Framework to Needs and Capacities

In establishing or further developing a legal framework—defining which parameters or impacts will be regulated, what levels of protection are necessary, and which policy instruments to use—it is useful to consider the following:

. Requirements and levels of protection should be responsive to Salvadoran environmental problems, needs, and priorities, and to the Salvadoran natural, material, social, and economic reality.

[27] Including the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Basel Convention, the Vienna Convention, and the Montreal Protocol, the Convention on Biological Diversity, the UN Framework Convention on Climate Change and the Kyoto Protocol, the Wetlands Convention (RAMSAR), the UN Convention to Combat Desertification, the Rotterdam Convention, the Stockholm Convention, and the Cartagena Protocol.
[28] For instance, on wastewater.

. International standards and foreign experience are valuable guides, but copying them without reviewing their assumptions and implications may be counterproductive.

. The regulated community's ability to comply with the law and the government's ability to enforce it should be considered in designing and modifying laws, regulations, and norms. Exceedingly ambitious requirements often result in generalized noncompliance rather than providing high levels of environmental protection. Combinations of instruments like minimum environmental quality standards and recognition of superior environmental performance may be better suited to promote high environmental protection.

. To ensure that benefits of the proposed regulations are greater than compliance costs, many countries—particularly OECD countries—have developed Regulatory Impact Analysis (RIA) systems. RIA is a method of systematically and consistently examining selected potential impacts arising from government action or inaction, and of communicating the information to decision makers and the public. RIA attempts to widen and clarify the relevant factors for decision making, and has many internal and external objectives. It helps to identify possible impacts on society and on the public administration (that is, enforcement), and thus improve regulatory design. RIA has become in some countries the key mechanism for coordinating policies and instruments among ministries. It can help reduce duplicative and contradictory policies. RIA aims at external objectives, as well, by enhancing regulatory transparency and accountability of the administration. As its use expands, RIA can help define which government actions are suited to a market economy.

. DR-CAFTA recognizes each signatory's right to set its own levels of environmental protection and to establish and modify environmental laws and policies accordingly. At the same time, El Salvador is committed under DR-CAFTA to striving for high levels of environmental protection, enforcing its own environmental laws effectively, and avoiding weakening environmental protection to encourage trade with another party to DR-CAFTA and to encourage investment in its territory.

Where environmental protection goals are not being served by existing environmental policies, laws, and regulations, these should be adjusted. While keeping in mind the obligations under DR-CAFTA, requirements and standards should be maintained or raised only if the overall costs for businesses (for example, administrative and material) and for the government (for example, enforcement resources) are appropriately balanced by the benefits they bring to society and its environmental goals. Existing and new standards should aim at high levels of environmental protection (in tune with the country's needs and priorities) while avoiding penalizing firms with unjustifiable compliance costs and/or fomenting informality and even corruption. The experience of other countries—particularly within the Organisation for Economic Co-operation and Development (OECD) countries—has revealed that this is a central aspect when assessing the potential regulatory burdens of legal and regulatory measures (see Box 5).

Furthermore, despite impressive progress in promoting export-oriented production, the current framework also has weaknesses vis-à-vis World Trade Organization (WTO) sanitary and phytosanitary (SPS) requirements, which raises issues in terms of market access. For instance, the country lacks important procedures for the identification of new pests in the country or the organization of surveys of crops on a regular basis, and documented procedures for certified alterations, security mechanisms over official seals, or approval of consignment identification, guidelines, or standards for undertaking risk analysis that is consistent with the WTO SPS Agreement (see trade section in chapter IV).

1.3 Environmental Policy Instruments

The LMA contemplates a variety of instruments such as environmental information systems, market-based economic incentives, environmental education, and economic

valuation of natural resources in national accounts. Among these, El Salvador still mostly relies on the EIA process and environmental information tools.

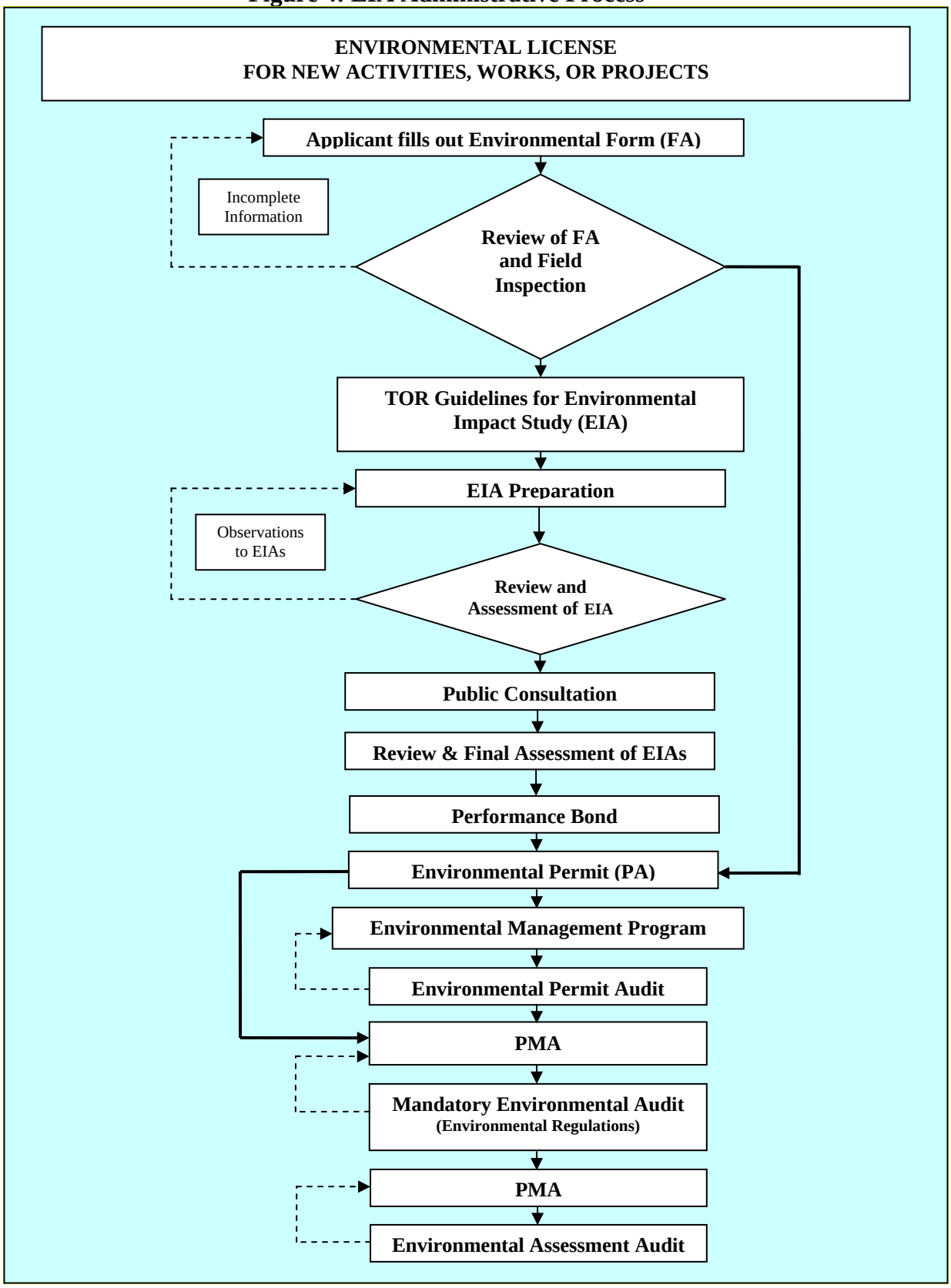
1.3.1 The EIA Process

The main tool for environmental protection under the LMA is a permitting system (sistema de gestión ambiental). This system requires Environmental Impact Assessments (EIAs) for new projects and environmental diagnostics for facilities that existed before the law came into force. Article 21 defines the activities, works, and projects subject to an EIA. They include airports, pipelines, and solid and hazardous waste storage or disposal facilities. However, article 21 also mentions "any other activity that might have considerable or irreversible impacts on the environment, health or human well-being or ecosystems." This open-ended provision means that, in practice, there is no prioritization. Virtually all activities have to submit a project description (formulario ambiental) and be subject to a site visit, for MARN to determine whether they only need an environmental permit or must prepare an EIA.

After MARN has reviewed the formulario ambiental and determined that an environmental permit is required, MARN provides the applicant with terms of reference to prepare the EIA. The applicant then typically hires the services of an individual or firm registered with MARN to prepare the EIA. The LMA provides a 20-day period for a response from MARN to a formulario ambiental, and for a 60-day period to review the EIA and grant or deny a permit. However, in MOP's experience, for example, the initial response has taken from four to six months and the permit decision up to three years.

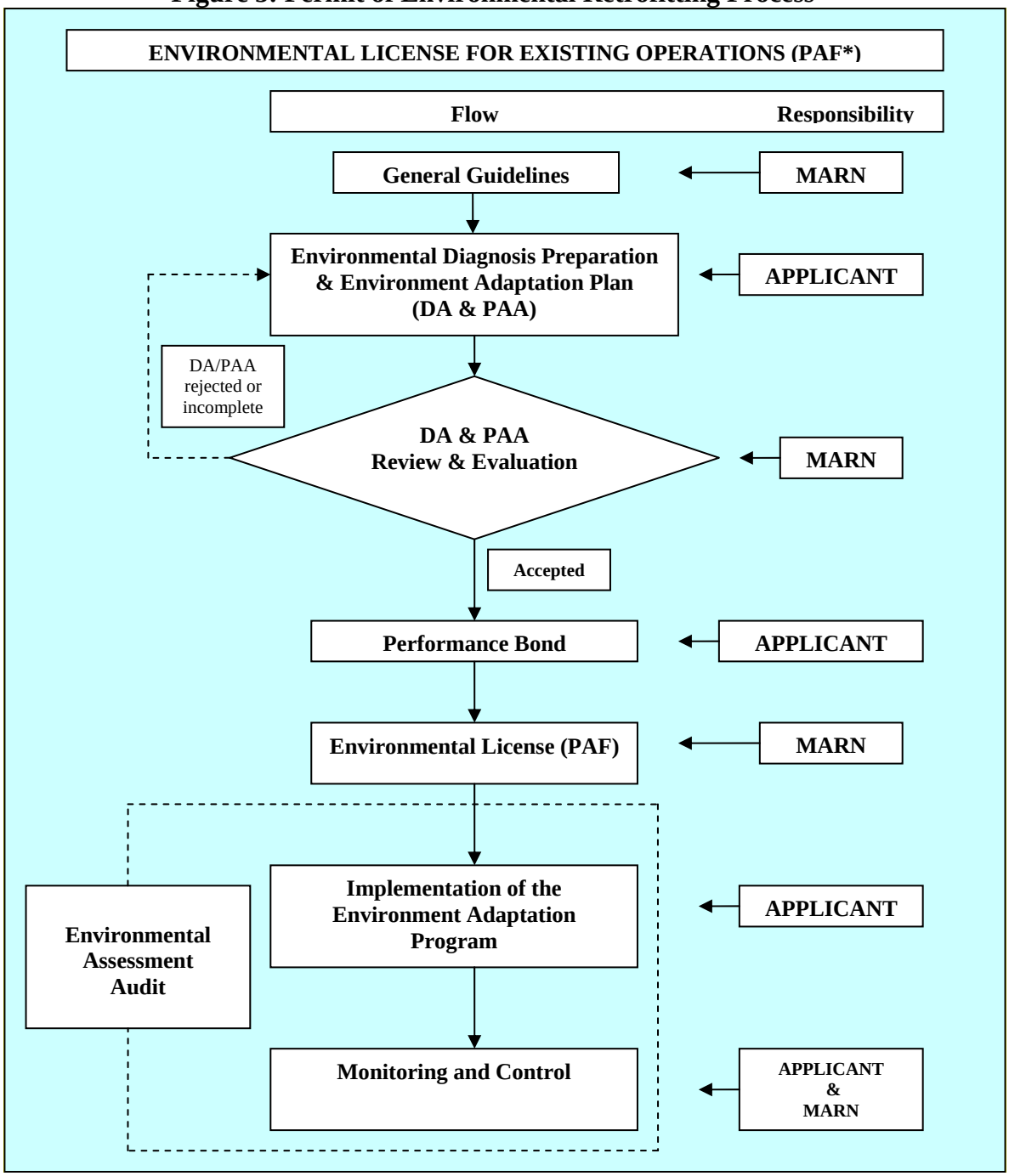
The EIA must include an environmental management plan (programa de manejo ambiental) setting out the preventive and corrective actions that will offset the project's negative environmental impacts. Compliance with this plan must be guaranteed with a bond (fianza de cumplimiento). In the absence of national quantitative regulations and standards, MARN uses its discretion and defers to international standards (usually from the EPA or the World Bank) in reviewing an EIA and requiring adjustments to the environmental management plan. If MARN deems the project acceptable, it grants the environmental permit. The compliance bond is then released pursuant to an audit carried out by MARN, at the request of the project proponent, verifying that the environmental management plan is actually being carried out. Figure 4 illustrates the process.

Figure 4: EIA Administrative Process



The LMA also includes facilities and activities that were already operating when the law entered into force. In that case, it required addressing their negative environmental impacts by preparing an environmental diagnostic and submitting an environmental adjustment program (programa de adecuación ambiental). The process is similar to the EIA and a bond is also required (see Figure 5).

Figure 5: Permit of Environmental Retrofitting Process



* PAF: Stands for *Permiso Ambiental de Funcionamiento.*

In the last few years, the government has invested heavily in the development of an effective EIA process. Theoretically, the EIA process and requirements are adequate and not far from international best practices. In practice, however, the following design problems are raising significant issues in its implementation.

First, the lack of clear criteria for classifying projects (as to whether an EIA is necessary and if so, the type of assessment needed) has led to elaborate and burdensome EIAs. In addition to the unnecessary costs for firms, this has also produced a backlog of nearly 2,500 EIAs pending review[29], thereby delaying the permitting process from the statutory 60 days to up to two years in some cases.[30] This huge backlog is hampering MARN from focusing on reviewing projects for which EIAs are the most effective and efficient policy instrument.

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. Furthermore, it provides opportunities for illegally influencing the decisions taken by the authorities. Improvement in the quality of the technical standards should eliminate many of these problems. In particular, it should permit the implementation of new mechanisms, such as ANDA's proposal for a standardized single Environmental Diagnostic for groups of similar activities, which could expedite review of its approximately 180 outstanding projects.

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

Fourth, the EIA process is in practice so burdensome and slow (and lacking conformity assessment, verification, and enforcement) that it creates incentives for noncompliance. Although applicants are required to guarantee their compliance with a bond and are entitled to have it released upon compliance of the applicable environmental protection measures, many renew their coverage rather than submit to an audit to release the bond. From June 2004 to May 2005, bonds for $4,780,000 were delivered of which $1,055,000 have not been released

Fifth, the EIA is not included in the requirements that are funneled through the successful business one-stop-shop of the Oficina Nacional de Inversion (ONI), so that the environmental permit requirement and the EIA process to obtain it add a layer of complexity and regulatory risk for both national and foreign investors.

[29] Since the preparation of this CEA the backlog has been substantially reduced.
[30] Comments by MARN Executive Director at a workshop on SEA and environmental permits held on October 26–27, 2005 in San Salvador.

To solve some of these problems and alleviate delays in the EIA process, MARN has promoted an interim "characterization system" involving 13 economic activities. Other actions to reduce the backlog and delays include:

- The delegation of some of MARN's functions—including the follow-up of environmental management programs and mitigation measures—to the environmental units of "high consumers" of permits like ANDA, CEL, and MOP.
- The development of specific coordination links between MARN and some of these key public bodies to expedite the issuance of permits.
- The signing of agreements between MARN and the National Association of Private Enterprises (ANEP) to improve environmental compliance and performance by specific sectors. For instance, a draft on cleaner production for the pork industry has been agreed and should enter into force in the next few months.[31]

1.3.2 Information Mechanisms

A second tool established by the LMA has been the development of a modern information system to help the public, the government, and MARN protect the environmental and the natural resources. The LMA contemplated two information-based policy instruments: an environmental information system and an inventory of emissions. The latter has not been implemented. The former, the existing Environmental Information System (Sistema de Información Ambiental, SIA), is not yet fully functional, although a good basis exists and useful efforts are underway to systematize information in some areas, like EIA. The SIA should aim to gather, systematically and consistently, reliable data. Such data will support policymaking, priority setting, administrative processes, enforcement programming, and strategic decision making throughout the environmental management system.

In parallel to SIA, MARN can make use of the existing system for geographical information and risk monitoring (the National Service of Territorial Studies, SNET) established in 2001 and which is an autonomous agency of the Ministry. Many experts consider SNET to be one of the best systems of its kind in the region. SNET periodically and systematically gathers data on meteorology, hydrology, risk (natural disasters), seismology, geology, and geographical information, and provides public access to this information through the Internet. Linking the SIA with SNET should present fewer obstacles given that SNET is under the administrative umbrella of MARN.

Although a great deal of environmental information is available through MARN and its website, there are still significant information gaps, such as on aquifer levels, number and quality of existing wells, pesticide runoff, solid and hazardous wastes, and the health impacts of pollution. The section entitled "Environmental Information" on MARN's website contains a series of sophisticated geographic, hydrologic, and political maps with

[31] Acuerdos de Cooperación Ambiental para la Competitividad.

basic descriptions of, among other things, water basins, natural protected areas, land uses (1996), and areas of high risk. The website also has a report on the state of the environment published in 2000, and a Global Environmental Outlook report issued in 2002. The latest collection of environmental information, Medio Ambiente en Cifras 2003, provides important information on natural resources, pollution, and environmental quality, but it would be preferable if this information was collected periodically and incorporated into the planning, decision making, and compliance-monitoring frameworks. These reports and maps notwithstanding, most of the information on the MARN website is static, seldom updated, and not yet linked with other available information.

Further improvements for modernizing environmental information resources include:

- Ensuring the compatibility of databases.
- Systematizing and securing a repository of existing information to avoid significant and irreparable losses of "intelligence" due to staff turnover in key areas such as Natural Heritage.
- Gathering information concerning compliance with environmental laws and regulations, the cost of compliance, and the effectiveness of enforcement measures in terms of achieving applicable environmental objectives.[32]

1.3.3 Other Instruments

The LMA contemplates additional instruments such as economic instruments and environmental land use planning and zoning. However, in practice MARN has developed and relied exclusively on the environmental control provided by the EIA/Diagnostic process.

One area that has received recent attention is the use of market-based tools, like the existing spent-oil collection program. The private sector has urged MARN to initiate research into how "environmental incentives and economic disincentives" could be used effectively, such as the establishment of water use and wastewater discharge fees.[33] Although there is interest in these tools, El Salvador has not yet caught up with other countries in using market-based solutions and other newer approaches.

1.4 Stakeholder Participation[34]

Starting during the discussion of the draft LMA, the Salvadoran government has encouraged an open and accessible approach to environmental policy (see Box 6). The law specifically provides for different instruments and processes to ensure that

[32] This information would be particularly useful for assessing the impact of the environmental framework on competitiveness and investment.
[33] ANDA charges water fees, but the rates are based on the cost of the service and are not designed to promote sustainability and internalize the environmental costs of using water.
[34] Participation is defined as a process through which stakeholders influence and share control over development initiatives and the decisions and resources that affect them (World Bank 1996).

stakeholders and interested individuals have the opportunity to participate. Many transparency mechanisms have been designed to complement and sometimes substitute other more expensive instruments. As the citizen complaint process under MARN has demonstrated, citizen participation supports compliance verification.

Box 6: Participation and Environmental Legislation in El Salvador

In 1992, El Salvador ended a decade-long civil war with the signing of the Peace Accords, and embarked on a journey of reconstruction and democratization. In 1994, the US$20 million PROMESA Project (later renamed Green Project), through its Policy Component, supported the government in the formulation of the country's first comprehensive environmental law (National Environment Law, LMA). The Project's main partners in this endeavor were the Environmental Secretariat (SEMA) and the Legislative Assembly's Health and Environment Committee. This Committee had the particularity of being the only one in which all five parties were represented, resulting in a very active and rich environment in which to deliberate the LMA.

At the outset the Project laid out the action plan to the government. The plan called for a participatory consultative process, which was initially strongly opposed by the government. Vested interests possibly felt threatened with the prospect of environmental legislation and its accompanying regulation. Strong support from the international community provided the leverage needed for the government to finally engage.

A first draft was commissioned with renowned environmental lawyers and presented to the committee for discussion. Importantly, the Project was able to offer a constructive environment within a neutral space, along with experienced facilitators, whereby long hours of lively discussions eventually resulted in a draft law. The Project also supported analytical pieces that proved instrumental in providing the substance necessary on which to base approval of the law. In particular, the analysis of current compared to optimal land use and the economic impact of environmental degradation were of interest to the President's Economic Cabinet, and even more so when the second study showed that the cost of environmental degradation was approximately 3 percent of GDP, which was equal to that year's GDP growth.

A national consultation on the LMA was initiated in late 1995. This was the first time a participatory process was used to formulate a major law in El Salvador. Each of the 14 Departments was visited, with all sectors and municipal authorities invited. In San Salvador, the capital, environmental NGOs, the private sector, the Supreme Court of Justice, and government institutions, were all consulted. In total, the opinions of close to 1,300 people were heard, collected, processed, and incorporated into the draft. Not only was the process in the end considered successful, it set a new standard and practice for all new legislation.

It is the prerogative of the Legislative Assembly to submit the final version of the law. After the national consultation, and further consultation with the environmental authority, further adjustments were made to the draft law. One such change refers to the Environmental Impact Assessment (EIA) process, which, due to bureaucratic resistance, remained fully tied to the Ministry of Environment despite the lack of capacity of the agency to tackle the expected volume of work.

Upon submission to the executive for final approval, an attempt was made by the President's office to remove the chapter on Citizen Participation in Environmental Management. In the wake of the national consultation, this was met with widespread opposition, which resulted in the Legislative Assembly ignoring this suggestion. The LMA was finally approved by the Legislative Assembly of El Salvador on March 2, 1998 and sanctioned by the President of the Republic on April 24, 1998.

Like all laws, the LMA is imperfect. Many different forces—including civil society, the private sector, the government, and international agreements—came together and contributed in important ways to influence its outcome. However, there is consensus, that the most important element that made the law possible was the fact that it was formulated, consulted, and written in a participatory manner. The participatory consultation of the LMA definitely influenced the content of the law. This was seen as an opportunity to share control over legislation that would affect all citizens in the country.

1.4.1 Legal and Regulatory Consultations

Article 10 of the Regulations of the LMA requires broad public consultation prior to the adoption of the National Policy of the Environment and of institutional policies, plans, and programs related to environmental management, and prior to approval of concessions for exploitation of natural resources. However, El Salvador 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 have most OECD countries and an increasing number of "transition" countries (see Box 7). Interestingly, this public comment process was carried out in adopting some specific laws.[35]

On the other hand, the CONACYT's standardization committees that decide on the content of technical standards do follow WTO practices in terms of transparency and accountability. For instance, these committees have balanced representation and use "notice and comment" procedures in the development of technical norms.[36] On the latter issue, however, CONACYT officials recognize that the time frames for public comment are too short and that few comments and complaints have resulted.

Box 7: 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:

i) Is the problem correctly defined?
ii) Is government action justified?
iii) Is regulation the best form of government action?
iv) Is there a legal basis for regulation?
v) What is the appropriate level (or levels) of government for this action?
vi) Do the benefits of regulation justify the costs?
vii) Is the distribution of effects across society transparent?
viii) Is the regulation clear, consistent, comprehensible, and accessible to users?
ix) Have all interested parties had the opportunity to present their views?
x) 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.

[35] This was the case of the LMA and the Forestry Law, which, prior to adoption, were widely consulted, with apparently very positive results.

[36] A representative of the government, business, professional, and academic sectors participate and vote. So far, most norms have been adopted by consensus.

1.4.2 Consultations Prior to the Approval of EIAs

The LMA also requires that the proponent of a project provide public notice concerning the availability of the project's EIA for public review prior to its approval.[37] MARN reviews and approves the notice, which must be published on three consecutive days in national media. The EIA is then made available for review at the offices of MARN in San Salvador 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 hold a public consultation in the municipality(ies) where the project is proposed, at the expense of the project proponent. Finally, MARN reviews all public comments before approving the environmental management plan and granting the environmental permit.

1.4.3 Citizen Complaints

MARN has developed a good system for citizen complaints, which seems to be trusted by the public. Complaints may be filed in person or in writing, or by calling a toll-free number. As of October 2005, MARN had received more than 800 complaints, of which it has investigated 90 percent. The large number of complaints may be attributable in part to the growing public awareness of environmental problems. Another factor may be that other government entities do not have a citizen compliant process like MARN's and people resort to MARN because it is seen as being more responsive.

1.4.4 Active Consultation

In September 2004, the government created the National Environment Commission (CONAMA) to function as the key consultative body for MARN. The council can "… propose, broker and collaborate with the corresponding entities the approval of environmental policies, issuing guidelines that contribute to maintaining and economic growth and a social development that are in balance with nature." CONAMA is comprised of the Minister and Vice-Minister of MARN, with the Executive Director of MARN acting as secretary, and seven representatives from nongovernmental organizations and the private sector, selected by the Minister. CONAMA's meetings are not public, but representatives share the discussions with their different sectors.

The same decree created an Executive Environmental Committee (Comité Ejecutivo del Medio Ambiente, CEMA) the task of which is to ensure that CONAMA decisions and directives are followed. The decree that created CONAMA calls for a regulation that would formalize the functions of the Council and the Executive Committee; however, this regulation has not been issued and these bodies operate in an ad hoc way.

[37] Article 25 of the LMA and Articles 10 and 32 of the Regulations of the LMA.

These positive developments are making the environmental area a leader in terms of transparency and accountability within the Salvadorian legal framework.[38] The complaints mechanism is particularly noteworthy.

1.5 Compliance and Enforcement Mechanisms

The LMA has a section defining violations, sanctions, administrative and judicial procedures, and civil liability for environmental harm. Administrative sanctions for environmental violations include fines ranging from the equivalent of 2 to 5,000 times the monthly minimum wages. Facilities or activities that fail to file the environmental diagnostic may be barred from operating until they comply with the requirement. Environmental crimes are included in the Criminal Code and sanctioned with potential prison terms of up to 10 years, although the offender may avoid sanctions by voluntarily and promptly remedying the damage caused to the environment.

Although one of the stated principles of the LMA is a preference for inducing environmentally sound behavior over sanctioning, there are almost no mechanisms in the current framework for encouraging a higher rate of compliance. Intermediate actions could include notices of violations, warnings, and compliance agreements. These actions may be more effective in fostering compliance than relying solely on deterrence when combined with credible sanctions and a track record of enforcement. The law allows for alternative tools like voluntary application plans in lieu of environmental diagnostics, but the overall emphasis is on administrative sanctions, criminal penalties, and compensation.

Currently, the only action enforcement officers may take officially before resorting to the LMA's sanctions are precautionary measures (actuaciones previas).[39] However, in reality, MARN enforcement officers report that they carry out precautionary measures based on civil law with the aim of conciliation and, when possible, provide the potential violator with an opportunity to carry out remedial measures. In their opinion, the use of compliance promotion mechanisms prior to the sanctioning process would improve effectiveness (see Box 8). In addition, El Salvador has tried some compliance mechanisms, including the grace periods granted for filing environmental diagnostics and the requirement of exhausting administrative avenues before pursuing environmental crimes, but these mechanisms do not appear to have had a positive impact on increasing the level of compliance.

Box 8: 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 activity: 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.

[38] The government is preparing a new law on transparency, which will further increase stakeholder and citizen participation.

[39] Articles 91 to 98 of the LMA.

. Enforcement officers will administer the Act with an emphasis on 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; and 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 their 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. Organizational Analysis (the Players)

Some institutions may function without an organization to drive them, but these are few. Most governments have thus relied on bodies and bureaucracies, with mandates, targets, budgets, and personnel to implement the "rules of the game." This is especially true for environmental matters where most of the costs are linked to externalities. This section analyzes the principal Salvadoran players operating according to the "rules of the game" described above, and how they paradoxically "play and change" the rules simultaneously.

2.1 Functioning of the Ministry of Environment and Natural Resources (MARN)

MARN was created by the LMA in 1998 as the executive agency responsible for setting El Salvador's environmental policy and guiding its implementation. MARN has an expanding set of responsibilities including:

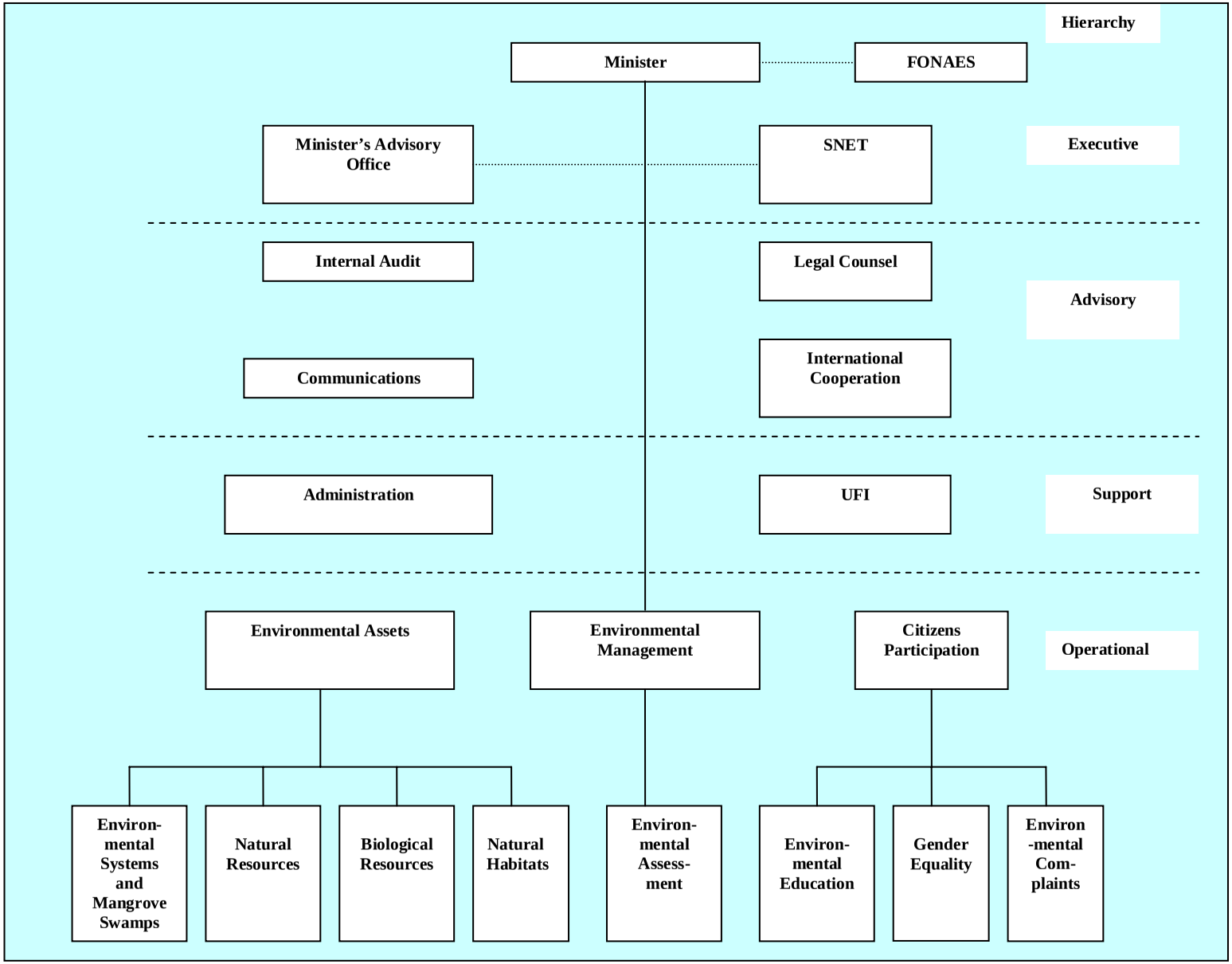
- Protected nature areas
- Wildlife conservation
- Environmental assessment
- Environmental information
- Pollution prevention and control
- Environmental incentives
- National prevention and emergency planning
- Environmental risk
- Import and transit of hazardous substances
- Hazardous waste disposal
- Environmental norms
- Ecosystems protection
- Administrative sanctions for environmental violations.

To deliver on this impressive array of tasks, the Minister of the Environment, together with a Deputy Minister and Executive Director, is assisted by three Directors General at the operational level and their supporting staff.[40] Figure 6 shows MARN's organizational chart before the recent establishment of the Inspectoría Ambiental.

However, perennial shortages of resources and the accumulation of tasks has translated into a day-to-day workload that impedes effective planning and coordination and that appear to be preventing MARN's senior staff from looking at the larger picture, which is assessing the current situation, setting priorities, planning, and reallocating resources, and making the best use of the toolkit the legal framework provides.

[40] SNET, as an agency, is under the Minister but has a great deal of autonomy.

Figure 6: Ministry of Environment and Natural Resources
(before the establishment of the *Inspectoría Ambiental*)



2.1.1 Budgetary and Staffing Situation

MARN is one of the smallest ministries in El Salvador. In 2005, it received less than 0.5 percent of the government budget of more than $3 billion,[41] and this proportion has hardly changed in the past few years (see Table 3).

Table 3: MARN Budget and Employment Allocations

Year	General Budget (US dollars)	Grants and Loans (US dollars)	Employment
2001	$4,053,294	n.a.	142
2002	$5,302,445	n.a.	228
2003	$5,402,570	n.a.	226
2004	$5,649,950	$5,000,000	224
2005	$5,383,150	$8,169,900	219
2006	$5,333,150	n.a.	n.a.

n.a. = Not available.
Source: MARN and National Accounts.

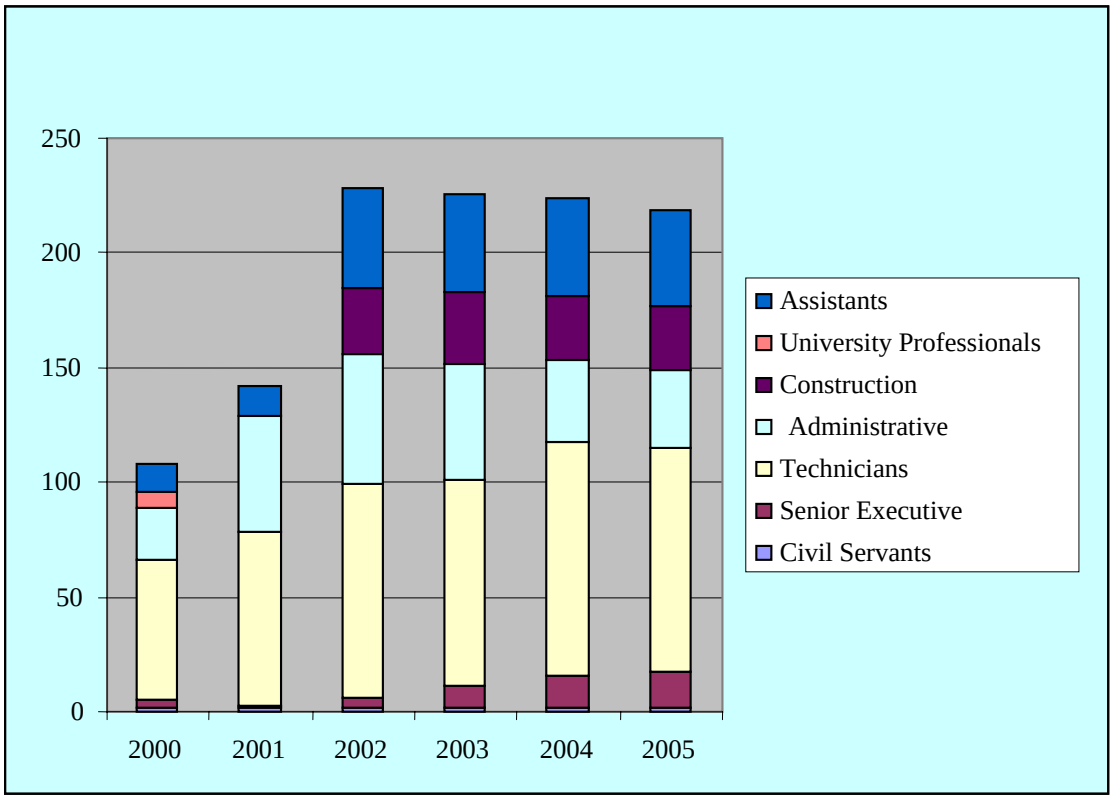
In recent years, MARN's budget has started to rely heavily on foreign resources. Today, loans and international donors are the source of more than half of MARN's budget (see Table 3). In addition to the vulnerability and lack of sustainability that this implies, it also contributes to organizing the budget according to projects rather than policies, which tends to undermine the coherence of El Salvador's environmental agenda.

This tight budgetary situation is compounded by a difficult staffing situation. In 2005, the ministry had 219 civil servants out of more than 125,000 personnel in the executive branch. Though MARN nearly doubled its number of employees in 2002, since then the number of staff has slightly declined (see Figure 7), a trend reversed in the 2006 budget with additional inspectors. Insufficient capacity has so far been a problem mostly for the inspections systems, which needs to verify compliance with the environmental management or adjustment plans of the projects that receive an environmental permit.

On the other hand, the quality of professional expertise seems to be appropriate. MARN has been able to attract and maintain a significant number of motivated public servants.

[41] The Ministry of Finance determines the budget that MARN receives based on MARN's proposal and overall government priorities.

Figure 7: Number of Positions in the MARN



2.1.2 Internal Allocation of Resources

The MARN budget and the allocation of resources within it are not based on periodic analyses of needs and priorities, but essentially follow the allotments set in previous years. This makes the resource allocation inside the Ministry quite ineffective.

In fact, the internal allocation of resources inside MARN is skewed toward a single instrument (the EIA) which, despite commendable efforts by MARN's personnel, has nonetheless been unable to prevent the accumulation of a worrisome backlog of EIAs. Indeed, MARN currently concentrates more than 60 percent of its limited budget on the review of EIA forms, EIAs, and diagnostics for projects and facilities. Although it is the policy instrument preferred by the environmental authority, there are serious delays in processing EIA forms, a substantial backlog of permit requests, and practically no capacity within MARN to monitor compliance with the permits' conditions and enforce the law. Furthermore, this highly resource-intensive activity on behalf of industry is not cost-recovered—not even partially. Fees, fines, and penalties from environmental violations and crimes that might be used to finance specific programs are not earmarked for environmental spending, but go directly to the government treasury. This differs from the practice of municipal governments, where the local governments are able to keep monies received from any penalties they impose. Other countries tend to focus more on

other less-burdensome instruments like technical standards, norms, and emission and discharge limits.

2.1.3 Applying and Enforcing MARN's Mandate

The importance of enforcement cannot be overstated. The deterrent, corrective, and guiding effect of an environmental management framework, and its credibility, depend on the actual enforcement of its rules. Currently, four different departments within MARN handle compliance and enforcement:

- The Citizen Participation Unit, which receives public complaints and follows up on them with the Inspectoría or the Fiscalía, as appropriate.
- The Inspectoría, which investigates potential administrative violations concerning pollution, natural protected areas, and lack of environmental permits.
- The Audit Unit of the Environmental Management Department, which verifies compliance with corrective measures.
- The Legal Department, which prepares the resolutions for administrative penalties and sanctions for the Minister's approval and signature.

MARN created the Inspectoría in early 2005 to ensure compliance with the environmental law. The core idea for this new unit is to strengthen enforcement and compliance through random or programmed inspections. This inspection will replace the current practice of inspecting facilities only in response to citizen complaints. However, the Inspectoría has not yet been properly staffed. The Audit Unit focuses on verifying compliance with the environmental protection or adjustment plans of licensed facilities. Their visits are carried out only when the facility wants to release its compliance bonds.[42]

Creating the Inspectoría is an important accomplishment, but the number of inspectors is still insufficient. By early 2005, MARN had between five and seven inspectors for the whole country, including the head of the Inspectoría. Such a low number of inspectors means that it is impossible for MARN to carry out inspections after the permiso ambiental has been issued.

MARN estimates that 60 additional inspectors are needed—four in each of the 14 Departments of the country—at a cost of approximately US$2 million dollars. For the 2006 budgetary year, the Finance Ministry has authorized an additional 14 inspectors.

Though the Inspectoría is at the end of the day responsible for enforcing most environmental laws, other public bodies participate in this difficult task. The Attorney General of the Republic's Fiscalía Ambiental and the National Police investigate and prosecute environmental crimes, and the courts administer justice, review appeals, and resolve compensation claims for environmental damages (see Box 9). However, these

[42] Both areas are converging. According to a recent proposal to restructure MARN, two officers in charge of environmental audits would be transferred to the *Inspectoría*.

organizations also have weaknesses and gaps in their technical expertise, logistical materials, and support (such as laboratories).[43]

Box 9: Other Bodies Involved in Environmental Inspection

- The Attorney General of the Republic (Fiscalía General de la República) investigates and prosecutes **environmental** crimes through its environmental units, and may assist MARN in collecting fines and penalties. The Fiscalía has facilities in four regions throughout El Salvador. The regions and their 13 subregions do not necessarily coincide with the department subdivision, but rather with the required and particulars needs. The Fiscalía has a small environmental unit in each of the four main regions (San Miguel, San Vicente, Santana, and San Salvador). In theory, there should be 15 environmental prosecutors, but, due to greater priorities, four have been transferred to cover homicides and kidnappings.
- The National Civil Police (Policía Nacional Civil, PNC) carries out the investigations under the direction of the environmental attorney's office in coordination with the corresponding authorities. For example, if a tree is unlawfully cut, the PNC coordinates with the municipalities, MARN, the Ministry of Agriculture, or the Fiscalía. However, in the past three years the number of National Police has been halved from 300 to 150. In terms of facilities, there is a particular need for reinforcing laboratory capacity for toxicity and air-quality sampling. As a result, inspectors often have to limit themselves to visual inspections.
- The Human Rights Attorney's Office (Procuraduría para la Defensa de los Derechos Humanos) has an office for the defense of the environment. This office has received very few claims concerning the environment, possibly because most complaints regarding the environment are filed with MARN through its well-known citizen complaints system.
- Some coordination has taken place with inspectors from the Health Ministry, particularly concerning lead pollution, although this coordination is rather unusual. According to MARN, the inspectors from the health ministry are not technically qualified or specialized, few municipalities have environmental units, and their technical qualifications are limited.

Despite the fact that the environmental laws are strict and include serious penalties for offenders, in practice the record of enforcement against violators is quite weak. For instance, despite expiration of a second deadline in May 2001, an estimated 60,000 small businesses have not complied with the LMA requirement to submit a diagnostic and obtain a permit (see above). Due in large part to its lack of resources, MARN has not taken any enforcement action against these noncompliant businesses. In the five years since the citizen complaints process was put in place, no complaint has led to the imposition of a sanction or penalty. The Inspectoría has recommended sanctions to the legal department of MARN in 18 cases out of 938 reviewed since January 2003, but none has led to sanctions or other enforcement measures.

In addition, flaws and limitations within the judicial system have hindered compensation or sanctions for environmental crimes. Local courts, or jueces de paz, are in charge of many environmental cases, and they apparently lack awareness and expertise on environmental matters, in addition to having a considerable case burden. A rough estimate indicates that a typical judge in these courts hears approximately 500 cases per

[43] One of the few laboratories that possess most of the required equipment is the Salvadoran Foundation for Social and Economic Development (FUSADES) laboratory. However, its services are not free or available 24 hours a day, 7 days a week.

month, out of which only one relates to the environment.[44] In this judicial setup, few prosecutions are successful, apparently in part because of unlawful influencing of court decisions.

In sum, while efforts are being undertaken to strengthen enforcement, the Inspectoría and the environmental enforcement framework more broadly are still significantly weak. Resources are clearly an issue, but better structures, working methods, and guiding enforcement principles might also facilitate greater effectiveness of the existing capacities (see Box 10).

Box 10: Guiding Principles for Reform of Environmental Enforcement Authorities

The Guiding Principles for reform of environmental enforcement authorities were developed to serve as nonbinding guidance to the environmental ministries and the Environmental Enforcement Authorities (ENFAs) at the national and subnational levels in Eastern Europe, Caucasus, and Central Asia (EECCA). However, they might be useful in other transition or emerging economies, because they are based on a wealth of experience accumulated internationally.

I. Fundamentals of Enforcement

Principle 1. Environmental enforcement systems should ensure effective and efficient protection of human health and the environment.
Principle 2. In securing compliance, prevention is better than cure; therefore, ENFAs should maximize the deterrent effect of their activities.
Principle 3. ENFAs should treat the regulated community equitably; enforcement actions should have solid justification.
Principle 4. Environmental requirements should be enforceable and establish feasible compliance objectives.
Principle 5. ENFA staff should work with integrity and be fully accountable for any decision they take.

II. Responsibilities, Powers, and ENFA Organization

Principle 6. ENFAs should be established as autonomous institutions, with clear, legally defined responsibilities and appropriate powers to achieve their objectives.
Principle 7. An ENFA's organizational structure should reflect environmental priorities and legally defined responsibilities.
Principle 8. Enforcement decisions should be delegated to, and taken at, the lowest level where issues can be effectively managed; national-level ENFAs should provide appropriate support and coordination.
Principle 9. ENFAs should identify and establish effective working relations with other agencies and departments whose activities influence environmental enforcement.

III. Role of the General Public and the Regulated Community

Principle 10. ENFAs should ensure effective communication with the general public and provide opportunities for citizens to contribute to more-effective environmental enforcement.
Principle 11. ENFAs should establish mechanisms to assist the regulated community to better understand and voluntarily comply with environmental requirements.
Principle 12. ENFAs should require the regulated community to conduct self-monitoring and report on environmental performance.

[44] Approximately 30 percent of the complaints received lead to cases submitted to the judiciary; of these, approximately 15 percent receive a sentence. There have been sentences imposing prison terms of three years, but all sentences for environmental crimes have been commuted to house arrest or public interest work. The most common crime prosecuted is causing pollution (air and water), followed by forest depredation. There is a backlog of approximately 700 cases per unit because there are not enough prosecutors.

IV. Working Methods, Strategies, and Tools
Principle 13. ENFAs should adopt a performance-based approach in their working methods; this approach should be rooted in an iterative (cyclical) regulatory process.
Principle 14. Taking into account the need to set priorities, effectively balance preventative and punitive measures, and efficiently use scarce resources, an ENFA should develop tailored enforcement strategies, supported by annual implementation plans.
Principle 15. The ENFA's strategy and operational plans should accurately identify and profile the regulated community.
Principle 16. New regulatory requirements should be phased in over an appropriate transition period and take account of actions to be undertaken by the ENFAs and the regulated community, and their associated costs.
Principle 17. Each inspection should be planned and executed according to specified minimum criteria; an integrated approach should gradually be applied.
Principle 18. ENFAs should have access to adequate remedies in order to sanction noncompliance in a timely and proportionate manner.
Principle 19. Indicators should be developed against which ENFA performance can be measured and continuously improved.

V. Resources, Budget, and Financial Management
Principle 20. ENFAs should establish an effective system of personnel management that addresses remuneration, motivation, and professional development.
Principle 21. ENFAs should identify the human, material, and financial resources required to carry out their responsibilities; they should submit requests for resource allocations, with full justification, through the normal budgetary process.
Principle 22. ENFAs should apply rigorous budget and financial management procedures.

VI. International Cooperation
Principle 23. ENFAs should contribute to, and draw from, international experience on enforcement and compliance.
Effective implementation of the Guiding Principles will require a certain "enabling" environment, consisting of various elements, including agency-related prerequisites (clear objectives and a strategy to conduct reforms, firm leadership, selectivity and gradualism, understanding development trends), national prerequisites (political will, stakeholder participation, market and democratic systems of government), and international support.

Source: OECD (2003).

2.2 Interaction of the Ministry with other Key Actors

Effective public sector environmental institutions require a number of characteristics including effective cross-sectoral coordination; balance between centralization and decentralization of environmental oversight; and transparency, participation, and public access to environmental information (Lovei and Pillai 2003). As indicated in the previous section, the law has set up a series of venues for such capacities to work.

2.2.1 Interministerial Coordination

Despite the fact that nominally MARN is in charge of environmental policies, a series of powerful ministries and agencies (with larger budgets and resources) have important environmental mandates (see Box 11).

Box 11: Government Organizations with Key Environmental Responsibilities

. The National Water and Sewerage Administration (ANDA) is the official autonomous body responsible for providing the public services of potable water and sewers nationwide, with the exception of a few dozen municipalities where the local government provides those services. Despite the natural link between ANDA's mandate and the environment, the statutes governing its activities do not include provisions for environmental protection, pollution prevention, and sustainable use of water resources. Furthermore, ANDA is exempted from the requirements of the Forestry Law regarding land clearance, and wastewater discharges from its sewer systems are notorious for lack of treatment (only 3 percent is treated). On the other hand, ANDA has had an environmental unit (unidad ambiental, UA) within its quality assurance department since 1993. As of 2003, it has operated horizontally as an environmental committee under the coordination of the Gerencia Técnica of ANDA and is linked with all the operational and administrative areas. The committee consists of a multidisciplinary team of 15 people. It proposes environmental regulations, leads environmental management within the institution, and ensures projects comply with environmental requirements and coordinates interinstitutional relations with other entities, particularly MARN. With respect to EIA, ANDA also collaborates closely with MARN through its UA, which carries out many of MARN's functions, like follow-up on the environmental management program and mitigation measures. EIAs are prepared for large-scale projects, and small projects only require filling out a formulario ambiental and an environmental mitigation plan.

. The Ministry of Public Works (MOP) is responsible for public works, transport, housing, and urban development. MOP's environmental functions include planning, road construction, controlling air pollution from vehicles, and authorizing construction of new buildings. MOP has started transferring the three latter functions to municipalities capable of both technically and administratively absorbing them.[1] While there is no specific environmental policy in MOP, environmental considerations are included in all of its infrastructure construction activities, and MOP does not carry out projects without previously obtaining an environmental permit. MOP created an environmental unit—the Gerencia de Medio Ambiente—in 1994, and since then the LMA has strengthened it. The unit focuses mostly on obtaining environmental permits from MARN and, in effect, it carries out many of the actions that are normally MARN's responsibility, like following up and monitoring environmental management programs and mitigation measures. The unit is currently a multidisciplinary group with seven specialized staff, and has taken part in developing technical specifications for new road works, environmental permits, terms of reference for social impact assessments, procedures for ongoing projects, and a model follow-up report for ongoing projects. MOP has entered into an interinstitutional cooperation agreement with MARN to assign a group of staff to process environmental permits.

. The Ministry of Health and Public Assistance (MSPAS) has substantial powers and duties in many areas of environmental protection, such as waste management and hazardous substances, air and noise pollution, water quality, and urban land use planning, among others. Some of its environmental functions are as broad as those of MARN, but in practice, it carries out and enforces very few of them.

. The Ministry of Agriculture (MAG) has important environmental functions, including jurisdiction over fisheries, agricultural pesticides, and all matters related to forestry in areas other than natural protected areas (1 percent of the territory) and urban areas—which are under MARN and the municipalities, respectively. MARN is now responsible for wildlife, wetlands, and natural protected areas, which were formerly under MAG. MAG is also responsible for activities related to agriculture, plague control, and pesticide management. For instance, MAG is in charge of guaranteeing the safe and healthy supply of food for domestic consumption (both in quality and quantity), and enforcing the established limits for pesticide use in agricultural activities.

To counterbalance this situation and in order to mainstream environmental issues, MARN has used two main vehicles: its participation in Cabinet meetings and the use of the National Environmental Management System (SINAMA).

MARN takes part in the Social Cabinet Meetings, where it struggles to ensure basic coordination with other ministries and agencies at the highest level. Importantly, MARN does not participate in the Economic Cabinet Meeting, where key policy decisions—including on infrastructure investments—are discussed.

Nonetheless, important negotiations are undertaken by two key institutions at the center of the Salvadoran government (Presidential House, Casa Presidencial), which has a critical role in designing the policies, vetting the laws and regulations, assuring coordination among ministries and entities, and monitoring results:

- The Secretaría Técnica, which is responsible for facilitating coordination between the Cabinet and the President and ensuring policy coherence.
- The Secretaría de Asuntos Legislativos y Jurídicos, which is in charge of coordinating the details of proposed laws and reviewing proposed laws and regulations to ensure coherence with other laws and with the agendas of the different areas in the government.

Due to DR-CAFTA negotiations, access by MARN to these powerful central bodies—and to the Ministry of Economy—has significantly improved in the past few months.

As for SINAMA, this well-designed institution has struggled to work properly. So far, few members of SINAMA have established stand-alone environmental units. The exceptions are MOP and ANDA, the standing departments of which now function as environmental units (see Box 11).[45] The power generator, the Executive Hydroelectric Commission of Rio Lempa (CEL), also has a unit with three permanent technicians and six under contract for specific projects. Like MOP and ANDA, the environmental unit of CEL works closely with MARN on EIAs, taking on many of the functions that MARN is supposed to carry out.

The remaining environmental units tend to fulfill few active functions, and focus primarily on preparing EIAs and obtaining permits for their own projects. It also appears that most of the interaction currently happens between MARN and each unit individually, whereas SINAMA would serve its coordinating purpose more fully through multiagency actions.

The four main reasons advanced for SINAMA's current weakness are that:

i) All ministries are endemically short of staff;

ii) MARN lacks a purposeful secretariat to run SINAMA;[46]

iii) The head of SINAMA does not have a direct link with the presidential office and in particular to the powerful Secretaría Técnica, depriving the system of clearer political relevance and coherence; and

[45] These departments were created in response to recommendations from the Inter-American Development Bank.

[46] The responsibility for organizing and facilitating SINAMA meetings falls on the Executive Director of MARN, who acts as its secretary, but the Executive Director has many other functions and none of its staff focuses exclusively on SINAMA.

iv) An agenda for cooperation with other sectors on issues of common interest is yet to be defined.

A development that should strengthen interministerial coordination and thus the mainstreaming of environmental policy is the recent creation of the Executive Environmental Council (CEMA), which is the Executive Committee of CONAMA, and which in practice drives SINAMA.

Coordination with municipalities is scant[47]; there is no official municipal coordinating body within the central government. Most of the dialogue is done through the nongovernmental entity, the Corporation of Municipalities of the Republic of El Salvador (Corporación de Municipalidades de la República de El Salvador, COMURES), which promotes and supports municipal autonomy. So far the environmental agenda has not been the object of COMURES' attention. This body may yet play a role in establishing environmental units in municipalities that have not yet done so, and in fostering coordination among municipalities on environmental matters. Alternatively, MARN's Office of Citizen Participation has been charged with networking with municipalities, NGOs, and citizens. Such a situation raises important issues, due to the rapidly expanding role of municipalities in El Salvador and their important environmental mandates.

2.2.2 Coordination with Municipalities

Municipalities are autonomous and may enact and implement regulations concerning the environment (24 are in effect). However, because the LMA is very general and does not clearly determine the scope of federal jurisdictions, municipalities often grant permits for projects without acknowledging the need for federal permits (notably EIAs) or adopt regulations that overlap with federal initiatives, creating confusion for the regulated community. The effects of these legal ambiguities are exacerbated in the absence of a coordinating mechanism between the federal government and municipalities, and by the fact that COMURES (the association of municipalities) has not yet developed a program to assist municipalities on environmental issues and promote coordination and coherence in their approaches.

The main challenges for environmental management at the municipal level are achieving a clear definition of competencies, promoting coordination with the federal government and among municipalities; and building capacity to regulate, implement and enforce environmental bylaws. The recommendations of this report to improve coordination and planning at the federal level and to address the ambiguities and inconsistencies in the legal framework would surely facilitate the task of enhancing municipal environmental

[47]Article 4 of the Municipal Code grants municipalities jurisdiction over regulating all natural resource protection matters within the municipality. Matters regulated under the LMA are in principle excluded from municipal jurisdiction, but because the LMA is so general and ambiguous, many matters are open to regulation by the municipalities, leading to potential conflicts and overlaps. There are 24 municipal bylaws related to the environment. Municipalities can exercise—and in some cases have exercised—these wide autonomous powers, fostering a very complex and fragmented environmental legal framework. However, as the telecommunications and electricity industries' undertakings have shown, hard-fought negotiations can reduce or eliminate these jurisdictional problems.

management. For example, clarity in defining the role of municipal authorities in watershed management will be a fundamental element of the water management system. In addition, capacity building at the municipal level, already undertaken to some extent by the European Union's FORGAES initiative, is necessary to ensure that effective local environmental management is an integral part of the country's endeavor to achieve high-quality environmental management.

2.2.3 Coordination with Nongovernmental Actors

MARN is regarded by Salvadoran society as a modern and open organization. From the design of the LMA in the mid-1990s—where an open and lively discussion was organized—to its day-to-day practice, the Ministry has tried to compensate for its lack of economic and political resources with an open stance to society, repeatedly encouraging direct contact with stakeholders.

For instance, a strong cooperative relationship with the business sector has been nurtured. Organizations like the National Association of Private Enterprises (ANEP) have provided the expertise and representation to promote environmental initiatives and broker environmental agreements between enterprises and the government. The first agreement is to be signed shortly by MARN and the pork-producing sector.[48] A framework agreement for further collaboration is also being discussed.

Furthermore, El Salvador has profited from dialogue with the large number of nongovernmental environmental organizations. 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 the Salvadoran Foundation for Social and Economic Development (FUSADES), the Programa Salvadoreño de Investigación sobre Desarrollo y Medio Ambiente (PRISMA), the National Foundation for Development (FUNDE), and SalvaNATURA. MARN has also benefited from the support (including financial) of regional and international organizations such as the Central American Commission on Environment and Development (CCAD) and the European Union-supported initiative, Strengthening Environmental Management in El Salvador (Fortalecimiento de la Gestión Ambiental en El Salvador), known as FORGAES. (See Annex IV.)

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 in raising environmental awareness among the Salvadoran people, and have been key in raising the level of the policy dialogue on environmental issues.

This open approach to governance was further embedded in late 2004 when the National Environmental Council (Consejo Nacional del Medio Ambiente, CONAMA) was

[48] This initiative should promote environmental protection and help bring producers into compliance concerning environmental diagnostics and permits.

created. Since then, CONAMA has been meeting once a month to informally discuss certain environmental issues of interest to MARN.

Although it may be too early to assess the effectiveness and relevance of CONAMA's advice, the appointment of strong critics of the government's environmental actions may improve transparency and inclusiveness. Nonetheless, the Council suffers from a lack of public input in the selection and operation of the Council and a lack of mechanisms to follow up on its recommendations. Furthermore, its meetings and recommendations are neither public nor reported to the public, thereby hampering its representative status and perhaps even its credibility.

As for some of the key transparency instruments such as the notice and comment mechanisms linked to the EIA, unfortunately participation has been limited—except in cases when a meeting is held in the affected municipality. A major drawback has been the fact that few stakeholders are in practice able to review the EIAs at MARN's headquarters and within the short time frame provided. Moreover, many of the most affected parties may never see the notices published in the national media concerning a proposed project.

In terms of the overall quality of the consultation, two issues may need further consideration. First, the private sector has in the past few years gained considerable lobbying capacity, particularly through the National Association of Private Enterprises (ANEP), and usually is heavily engaged in rulemaking through ad hoc committees. Such laudable participation, however, has not been matched by similar access from NGOs and the general public when setting priorities and during the rulemaking processes. Second, lack of follow-up appears to be a general problem in consultations with stakeholders, NGOs, and citizens.

2.2.4 International Cooperation

International cooperation has been an important source of funding and technical contributions for environmental policy in El Salvador. USAID funds helped to develop the Environment Law and thereby the Ministry of Environment. IADB has provided important technical and financial assistance in the water and pollution control sectors. The European Union is supporting the country with a project to strengthen environmental management. The UNDP has been running a small grants program with a strong natural resource and environmental focus. The Bank has also provided technical and financial assistance in institutional strengthening, natural resource management, environmental management, biodiversity, and more recently in the consolidation and administration of protected areas, and in piloting mechanisms of payment for environmental services. Several other donors have been present in the environment area supporting the Ministry or local municipalities including attempts at reformulating the country's water legislation.

According to the MARN, there are 41 partners supporting El Salvador on environmental issues. Bilateral support accounts for 22 of these partnerships while the rest is divided amongst specialized agencies of the UN (7), international NGOs (3), international

conventions (6), the European Union, the GEF and the IADB. As of January 2006, MARN was implementing cooperation projects totaling US$62 million. Donations account for US$ 24.5 million. Donation resources were allocated to a wide range of issues, including clean technology, protected areas, coastal mangroves, water resources, watersheds, solid waste, sewage, civil society participation, agriculture and forests, conservation of natural resources, climate change, bio-safety, strengthening of the environmental management, ozone layer and sustainable tourism. The remaining US$ 37.5 million is a loan with the IADB (US$ 29.8 million) and the Government of Taiwan (China) (US$ 7.7 million) for the Decontamination of Critical Areas project.

The Decontamination of Critical Areas project is the largest internationally funded operation. The objective of this project is to establish a solid technical and institutional base for environmental decontamination in El Salvador. It also seeks to consolidate mechanisms for environmental management in three areas: (i) air pollution; (ii) water pollution; and (iii) solid waste. The project is scheduled to close in December of 2006.

The European Union follows with a US$ 11.3 million donation which ends in December of 2006. This project has the objective of strengthening environmental management in El Salvador. Special attention is being paid to local risk management and the inclusion of gender considerations in environmental policy.

The objective of the World Bank/GEF (US$ 10 million) Payment for Environmental Services Project is to support the development of markets for environmental services which will be provided by private landholders while enhancing and protecting biological diversity and preserving important forest and mountain ecosystems. This will be accomplished through the development of a market-based system to contract environmental services in priority areas, and to consolidate, expand and restore critical ecosystems in the production landscape.

The largest bilateral donor is the USA. One of the six activities under USAID's Economic Growth program is a US$9 million, three year initiative titled: Improved Management and Conservation of Critical Watersheds. It will support the consolidation and effective management of selected protected areas, habitats and natural resources.

These contributions show an increasing commitment from the international community to help the Government of El Salvador address its environmental problems. Coordination is also rising. The United Nations Development Program (UNDP) leads the ongoing donor coordination mechanism which has been realigned to promote international cooperation towards El Salvador's achievement of the Millennium Development Goals. The first donor meeting held in July of 2005 was chaired by the Vice-Minister of Environment and Natural Resources. There was general agreement amongst participating agencies to share project and activity information through a common template which would be compiled by the Ministry into a current matrix of donor activities. The next steps in the donor coordination meetings will be an important opportunity for MARN to map international cooperation against environmental policy priority areas. This will identify investment gaps and should enable the Government of El Salvador to guide these investments in

those areas most critical in attaining the Millennium Development Goals related to the environment.

3. Institutional and Organizational Performance

3.1 Assessing the Strengths and Weaknesses

The Government of El Salvador has undertaken major efforts to establish institutional and organizational frameworks for environmental protection. Though important challenges exist, the country has a healthy foundation, which will allow El Salvador to improve its regulatory management so it can respond effectively to existing and future environmental pressures that expanded trade and investment bring. Among the most important strengths, the following are to be noted:

- El Salvador has in place a general environmental law that establishes a sound basis for regulating environmental pollution and resource conservation. The existing legal framework is comprehensive and ambitious in its principles. The LMA also opens opportunities for developing an effective set of environmental policy instruments to tackle other environmental concerns.
- The country has established institutions for developing and implementing environmental policies. MARN can rely on an aware, motivated, and increasingly expert group of administrators.
- A strong cooperative relationship between the government and the business sector also provides a basis for fruitful dialogue. This relationship should permit the building of consensus and agreements on key aspects, such as renewed attention on enforcement. In particular, institutions like ANEP have the expertise and the representation to promote environmental initiatives and broker environmental agreements between enterprises and the government.
- Valuable contributions to environmental protection in El Salvador may also be expected from a series of NGOs that are engaged with environmental issues at different levels.
- The citizen complaint system is working and is one of the only incentives fostering higher levels of compliance with regulations.
- An important asset for further improvements is the increasing awareness at many levels within MARN of the environmental framework's weaknesses and the desire to address them. Other key areas of government (including the Secretaría Técnica and the Ministry of Economy) also appear to be interested in improving the environmental framework. There is an across-the-board recognition of the need to strengthen environmental protection while at the same time eliminating unnecessary hurdles for economic activity.
- Recent events such as Hurricane Stan have also raised widespread recognition of the need to toughen environmental protection while at the same time eliminating unnecessary hurdles for economic activity.

Specific ongoing efforts will continue making the system more resilient, adaptable, and active. Among these initiatives, the following merit attention:

- The recently created Inspectoría Ambiental should improve compliance verification and enforcement.
- A forthcoming legal framework on water should reduce duplications, overlaps, and contradictions with the LMA and improve the regulatory framework for managing this key resource.
- The forthcoming enactment of the two new laws on Wildlife and Natural Protected Areas will continue completing the legal framework.
- The development of a policy on transgenic organisms[49] (MAG and MARN) will provide a framework for addressing this difficult issue.
- The formulation of a land development plan—Plan Nacional de Ordenamiento y Desarrollo Territorial (Deputy Minister of Housing) will improve prevention and management of environmental risk and degradation.
- Efforts to reform the EIA system should be expected to eliminate the backlog on EIAs and improve environmental permitting.
- The development sectoral agreements—Acuerdos de Cooperación Ambiental para la Competitividad—should be expected to help bring the private sector into compliance.
- The government has started drafting a new law on transparency that is expected to strengthen accountability.

These efforts have taken El Salvador a long way toward effective environmental protection; however, the overall environmental framework still suffers from significant weaknesses that could not only reduce the final goal of sustaining development in the long term, but also minimize the benefits of DR-CAFTA and spur trade disputes.

- A renewed effort to establish priorities and coordinate their implementation is needed to tackle El Salvador's environmental degradation problems and put it in a position to address potential increased pressures related to expanded trade and infrastructure.
- Some important legal issues need to be resolved—particularly those concerning the lack of coherence of the rapidly expanding legal framework. A priority should be to reduce and hopefully solve the damaging overlap in the water area. Complex jurisdictional issues (for instance, with municipalities) also need to be clarified and resolved.
- Regulations and technical standards are needed in several areas, but the most urgent are regulations to ease the burden on the environmental management framework—the Sistema de Gestión Ambiental. In practice, efforts to implement the legal framework have focused on building the EIA process, while other

[49] An orgranism of one species into which one or more genes of another species have been incorporated.

instruments that could potentially be effective in addressing certain environmental issues, like technical standards for certain types of activities, incentives, and disincentives, are yet to be established. Better and clearer regulations will also reduce the excessive discretion that exists in obtaining environmental permits and improve compliance with the law.

- After seven years in operation, MARN needs to be revitalized and reinforced through improved priority setting, planning, coordination, and funding, and with an extension of its enforcement capacity and enhanced information systems.
- Increasing compliance with the law is a serious challenge, particularly for small and medium enterprises (SMEs). SMEs are numerous, less aware of environmental requirements, and have a smaller financial capacity to absorb pollution-prevention and resource-conservation costs.
- Enforceability and effectiveness of the legal framework tends to rely exclusively on "command and control" tools, which are more costly to operate and tend to be more costly to comply with. The enforcement system has also suffered from shortages of staff, resources, and adequate legal tools.

Overall, these weaknesses can be tackled effectively in the next few years. The environmental enforcement obligations under DR-CAFTA should be expected to promote compliance, improve monitoring and verification, and spark enforcement against violators. Preparation for the entry into force of DR-CAFTA (including this CEA) also opens up opportunities for breakthroughs on challenging issues and to respond to matters that have been postponed or at a stalemate. This is a time, too, where opportunities arise for assessing and adjusting existing tools and strategies.

3.2 Benchmarking the Applied Framework

The key question that needs to be answered is: What capacities of the public administration exist (or not) to respond to the needs of a world-class institutional and organizational framework to deal with environmental issues in El Salvador?

Overall public sector environmental performance in El Salvador can be improved through adoption of modern regulatory capacities based on international principles of good regulation such as[50]:

- Accountability and Security, which tracks aspects such as legal security, predictable interventions, and rules.
- Transparency, which is ensured through clear and simple rules, openness across the entire policy process, particularly stakeholder consultation, and combating corruption.
- Legitimacy, which relates to the need to protect safety, health, environment, consumer, and public interests with proper and funded mandates.

[50] This set of good governance principles is based on OECD parameters used to assess regulatory and institutional capacities (see OECD 1995, 1997, 2002).

- Efficiency, which guides the development and maintenance of low-cost rules, orderly and timely decisions, and flexibility according to market needs.
- Expertise, which guarantees that the skills and understandings exist to deal with complex markets and technologies.

Table 4 summarizes selected aspects—thought to have higher impact on performance—of the current institutional and organizational frameworks interacting in El Salvador according to those theoretical benchmarks. It also underlines how improving the state's regulatory capacities is not just a question of changing policies and laws. Sustainable change requires reforms to the practices, capacities, institutions, and even cultures in the public sector, which has long been accustomed to intervening in private sector activities.

Table 4: Key Benchmarks of the Institutional and Organizational Frameworks of El Salvador

	Accountability and Security (legal security, predictable interventions and rules)	**Transparency** (clear and simple rules, openness through the entire policy process, stakeholder consultation, less corruption)	**Legitimacy** (protection of safety, health, environment, consumer, and public interests in accordance with funded mandates)	**Efficiency** (low-cost rules, orderly and timely decisions, move swiftly to meet market needs)	**Expertise** (good regulatory skills and understanding of complex markets and technologies)
Policy	The policy lacks precise quantitative goals.	Instruments like CONAMA and mandated consultations on policies exist but need to be implemented effectively.	Sprawling priorities. Budget allocations nationally and within MARN do not reflect the severity of environmental problems.	Mainstreaming is not working properly due to lack of a secretariat and access to the center of government.	
Legal and Regulatory Framework	The legal framework lacks coherence and specificity. Adequate water laws are still missing.	Draft regulations are not properly consulted before enactment.	The LMA sets a high mark for protection that is not matched with adequate instruments and an implementation strategy.	MARN has overemphasized EIAs as the main environmental tool.	

	Accountability and Security (legal security, predictable interventions and rules)	**Transparency** (clear and simple rules, openness through the entire policy process, stakeholder consultation, less corruption)	**Legitimacy** (protection of safety, health, environment, consumer, and public interests in accordance with funded mandates)	**Efficiency** (low-cost rules, orderly and timely decisions, move swiftly to meet market needs)	**Expertise** (good regulatory skills and understanding of complex markets and technologies)
EIA	EIA requirement lacks categorization of projects.	The final permits are not made public and thus the public does not know the requirements imposed.	Lack of precise regulations and standards allows excessive discretion during the adjudication of authorizations.	Backlog of EIAs creates delays and thus reduces investment. MARN has initiated measures to reduce burden and time delay. Decisions take too much time.	The impact of the EIA process on environmental performance and competitiveness is not measured.
Environmental Information System	The Environmental Information System (SIA) still has important gaps.	MARN's website has a great deal of environmental information.	SIA is not used for policymaking purposes. SIA indicators are not updated periodically.	Links and synergies with SNET have not been explored.	
Consultation Processes	Active consultation with stakeholders is increasing, e.g., CONAMA.	CONAMA decisions and recommendations are not public.	Consultation of draft measures is not compulsory.		

	Accountability and Security (legal security, predictable interventions and rules)	**Transparency** (clear and simple rules, openness through the entire policy process, stakeholder consultation, less corruption)	**Legitimacy** (protection of safety, health, environment, consumer, and public interests in accordance with funded mandates)	**Efficiency** (low-cost rules, orderly and timely decisions, move swiftly to meet market needs)	**Expertise** (good regulatory skills and understanding of complex markets and technologies)
Compliance and Enforcement	Rate of compliance is low, particularly among small and medium enterprises.	Information on compliance is not gathered systematically and made available to the public.	Coercive measures prevail. Compliance promotion is lacking. The number of inspectors is low and there is no inspection program to target the most important problems rather than only reacting to complaints.	Too many requirements and too-high standards increase the risk of noncompliance Recent creation of an Inspectorate in the Ministry will increase efficiency.	Lack of laboratories reduces enforcement effectiveness. Third-party certifications, etc., have not been used.
Complaints and Appeals	Citizens' complaints are working. The courts do not play an important role.	Citizens' complaints are easy to file.		Legal recourse takes too much time.	Lack of expertise in the courts.

IV. Trade Liberalization and the Environment in El Salvador

1. Introduction

As a result of the policy of trade openness pursued by El Salvador in recent years, trade has increased substantially, especially in certain sectors of the economy. Exports grew from 19.8 percent of GDP in 1999 to 20.4 percent in 2004, while imports expanded from 30.7 percent to 36.2 percent in the same period. El Salvador's main trading partners are the Central American countries, and the United States is its leading partner outside the region. The opening of the Salvadoran economy has also been accompanied by a steady increase in foreign direct investment (FDI). During 1997–2002, FDI flow amounted to $2.3 billion.

While, the economic importance of the traditional agricultural sector has been declining (coffee, sugar, cotton, and so forth), the sector continues to exert considerable influence in terms of contribution to value added, and still employs around 35 percent of the working population. The manufacturing sector's contribution to the economy, on the other hand, has increased significantly, rising from 21.5 percent of gross domestic product (GDP) in 1996 to 23.5 percent in 2003. 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 zones, and to outward processing warehouses. Table 5 offers a comparison among traditional, nontraditional (manufactured goods), and maquila (mainly clothing and textiles) industries.

Table 5: Trade Patterns in El Salvador (in US$ millions)

	2001	2002	2003	2004
Total Exports	**2,646.6**	**2,757.8**	**2,904.0**	**3,044.0**
Traditional	194.0	142.8	154.0	157.0
Coffee	111.7	101.5	100.8	117.4
Sugar	63.7	33.2	42.5	35.3
Cotton	18.6	8.0	10.7	4.3
Nontraditional	925.6	992.2	1,011.3	1,196.9
Central America	664.8	683.1	691.0	750.6
Others	260.8	309.1	320.2	446.3
Maquila	1,527.0	1,622.9	1,738.8	1,690.0
Total Imports	**4,643.3**	**4,771.9**	**5,279.9**	**5,674.4**
Central America	757.2	747.0	786.4	860.8
Others	2,815.0	2,841.0	3,217.7	3,536.1
Maquila	1,071.1	1,183.9	1,275.6	1,277.4

Source: Central Bank of El Salvador.

El Salvador's commitment to trade liberalization has been fueled, to a large extent, by its bilateral and multilateral trade agreements. Since the turn of the century, a number of bilateral free trade agreements (FTAs) have been negotiated, including with Mexico (2001), the Dominican Republic (2001), Panama (2002), and Chile (2002). The recent ratification of DR-CAFTA is expected to deepen this integration with its most important nonregional trading partner, the United States.

Any openness of the economy is associated with certain implications for the environment and use of natural resources. Though the precise environmental impacts of the various bilateral, regional, or multilateral trade liberalization programs undertaken are often difficult to anticipate, a systematic analysis of the trade and investment patterns could give us a broad understanding of the environmental implications of greater economic openness. This would provide useful guidance for integrating environmental concerns in macroeconomic and sectoral policymaking and in strengthening appropriate institutions, especially as El Salvador continues to liberalize and modernize its trade and investment regimes.

2. 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 the North American Free Trade Agreement (NAFTA). This debate intensified with the creation of the World Trade Organization (WTO) and the subsequent commencement of the 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 maximization of 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.[51]

The concerns with 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 promote 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:

[51] A number of bilateral agreements have gone beyond the WTO to give attention to environmental protection aspects. Agreements such as the NAFTA and the U.S.-Singapore FTA directly address environmental concerns, and Regional Economic Integration Organizations (for example, MERCOSUR) deal with trade-environment issues more both 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 it have to meet certain clear-cut environmental policy requirements of the EU.

- **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 result in shifts in 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,** the risk being that these will be used as disguised protection for domestic firms.

In practice, however, the opposite often seems to be the case. Trade liberalization agreements usually also call for improvements in 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 the future development of the industrial and agricultural sectors. In the discussions about DR-CAFTA, much emphasis has been placed on the importance of the use of environment and natural resources (see Box 12).

Further, often more open trade 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, pressures 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).

Box 12 Environment in DR-CAFTA

Environmental provisions in the Dominican Republic-Central American Free Trade Agreement (DR-CAFTA) are designed to ensure enforcement of environmental laws through a public 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. DR-CAFTA also contains a section on voluntary mechanisms to enhance environmental performance. This innovative section requires parties to encourage voluntary performance guidelines; information sharing; and the development of incentives, such as market-based programs, to encourage conservation and protection of the environment. DR-CAFTA also requires countries to respect multilateral environmental agreements and to agree not to weaken their environmental laws. In addition, DR-CAFTA provides a mechanism for environmental capacity building and creates an environmental cooperation commission.

3. An Overview of the Literature

In general, trade liberalization can affect the environment through several mechanisms, such as interjurisdictional 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 empirical studies fall into three distinct categories. First, there are studies 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 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 1992:89–104; Dean 2002).

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 of some developing countries have become dirtier over time.

Nonetheless, given El Salvador'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 El Salvador continues to expand its international trade it may be specializing in pollution-intensive industries. Also, the shift from a traditional agro-based economy to a predominantly manufacturing economy may have the effect of shifting the pressure from rural to urban areas (see Box 3).[52]

The primary objective of this study is to examine the composition effect (see below) of trade liberalization in El Salvador and to formulate policy recommendations relating to its trade and environmental policies.[53] A retrospective analysis of El Salvador'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 effects on the environment as DR-CAFTA takes effect this year.

4. Trends in Exports and Imports

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 refers to the fact 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 in which they have a comparative advantage, and this tendency becomes more pronounced with freer trade. The technique effect refers to the 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 the 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 the export sectors in El Salvador using the Balassa index,[54] we find that El Salvador's comparative advantage is in sectors such as food processing, textiles, and basic manufactures that are generally

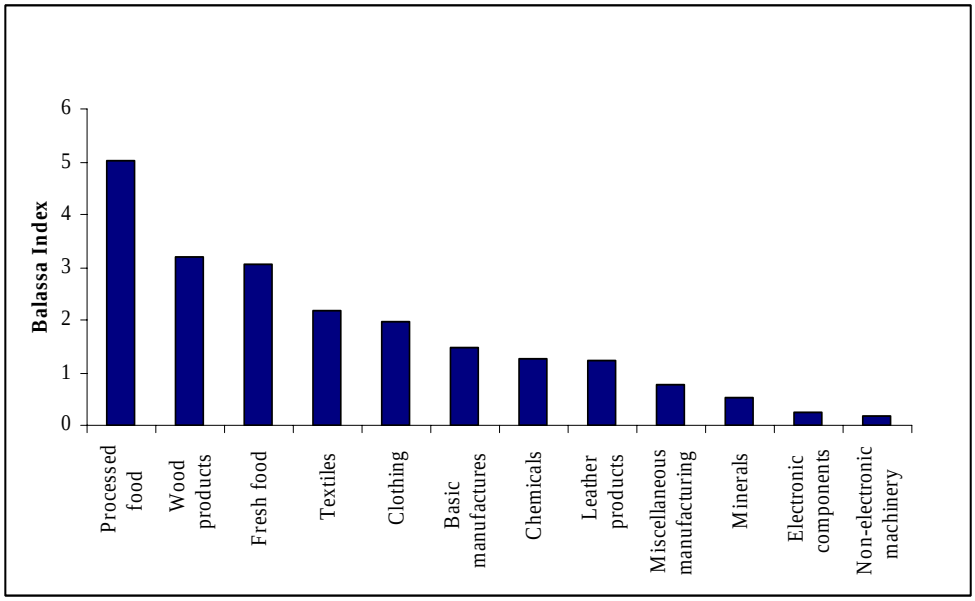
[52] There is evidence that in fact shows that tree cover in El Salvador increased 40 percent during 1992–2001. This is attributed to out-migration resulting from the civil war, and to relatively low food prices, which kept pressures off farming.

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

[54] 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.

considered more polluting (Figure 8). Hence the environmental implications of "composition effect" might not be small.

Figure 8: El Salvador's Revealed Comparative Advantage (according to the Balassa index)

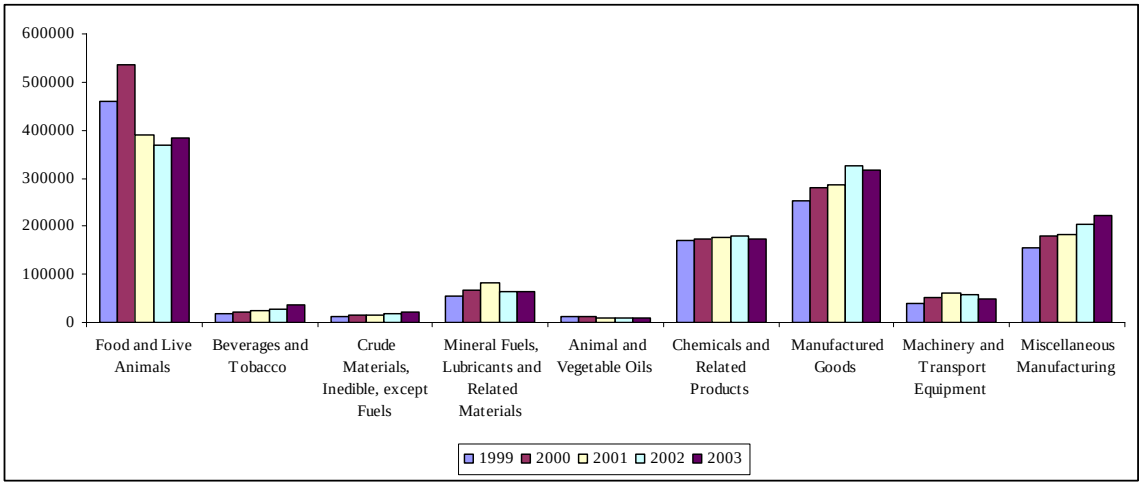


In terms of the scale effect, we find a steady increase in the volume of exports since 1999, though there has not been an overtly expansionary trend. Two sectors where this trend is slightly more pronounced are food processing (food and live animals) and textiles (manufacturing) (see Figure 9). While they are not considered among the core polluting sectors (for example, metal works), food-processing operations can produce considerable waste in a variety of forms such as wastewater, solid waste, and air emissions. These in the absence of adequate controls could become a serious threat to human health and the environment (see Box 13).

There is a noticeable increase in the share of manufacturing as a result of the opening up of the economy. The share of basic manufacturing especially has gone up from about 21 to 25 percent, and the share of miscellaneous manufacturing from 13 to 17 percent. Though this is less of a concern now, if this trend continues and there is increased demand in the world markets for Salvadoran manufacturing as more integration occurs, then there is a danger of increased pollution in the absence of any additional controls.[55] The share of the food sector continues to be high, although we see a declining trend, and the chemical sector remains more or less the same.

[55] Even within the manufacturing sector, exports of some of the more-polluting sectors, such as metal products, plastic products, paper products, garments, and steel, have in fact more than doubled. This is not reflected in the totals, however, because of the decline in some other sectors.

Figure 9: Sectoral Trend in El Salvador's Exports (in $'000s, 1999–2003)



Source: International Trade Center Trade Database.

Box 13: 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 of these sectors consume huge amounts of water for processing food. A considerable part of this water is potential wastewater that needs to be treated for safe disposal to the environment. Table 6 shows typical rates of water use for various food-processing sectors. An abundant and inexpensive source of water is a requirement for the food-processing industry. This coincides with the same need for water resources in agricultural farmland activities.

Wastewater and solid wastes 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 wastes include organic materials from mechanical preparation processes, that is, 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 byproducts and waste streams, which are extremely high in 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 wastes result from spent grains and materials used in the fermentation process.

Source: United Nations Industrial Development Organization.

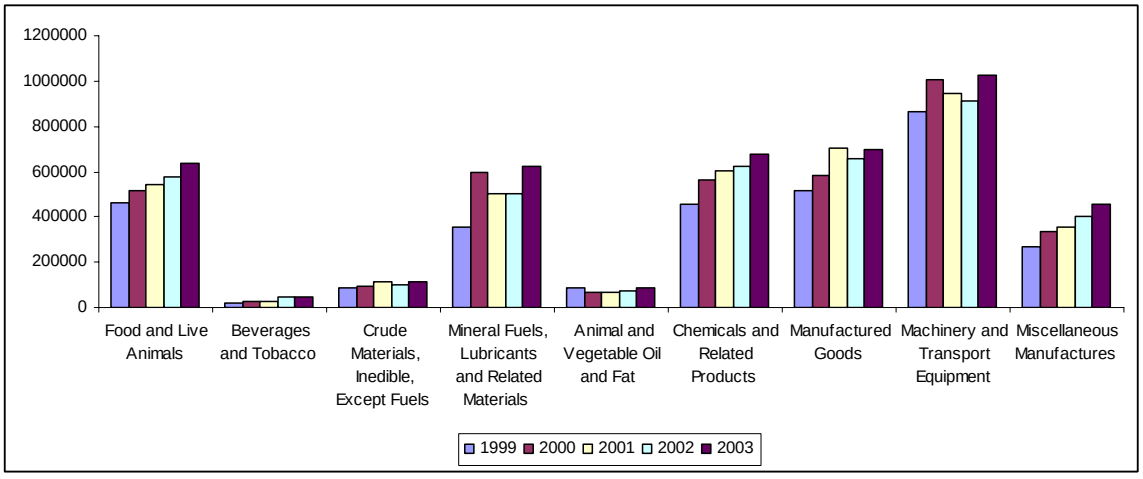
Table 6: Typical Rates for Water Use for Various Industries

Industry	Range of Flow Gallons/Ton 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

In terms of imports, El Salvador continues to be a major importer of heavy machinery and equipment, chemicals, and manufactured goods. Much of the imports are concentrated in certain categories such as chemical products, passenger cars, and basic manufactures (Figure 10). This reflects an increasing transformation from a traditional agro-based economy to a modern manufacturing economy. The environmental implications of this could be high if it also involves import of cheaper pollution-intensive technologies.

For example, there is cross-country evidence that shows that old and used cars can release as much as 10 times the emissions as relatively new or well-maintained cars. Also, the evidence from San Salvador suggests that air pollution from used vehicles is increasingly becoming a major health risk to the population. The increased availability of foreign exchange and reduced tariffs have led many small-scale entrepreneurs to import crashed or scrapped motor vehicles from the United States to be repaired and resold in the local market (Rosa 2004). The number of imported vehicles has in fact almost doubled from 242,000 in 1994 to 468,000 in 1999. The number of vehicles imported today is around 600,000 and the import value of vehicles and vehicle-related parts is over $800 million over the last five years. While health-damages from air pollution are quite obvious (Chapter II), one would have to do a more careful analysis of the costs of policy of prohibiting import of used cars. Increased textiles exports seem to have also fueled a simultaneous increase in industrial chemicals. Basic manufactures have also increased significantly in recent years and these are again a major source of toxic waste and water pollution. The increasing use of chemicals in textiles and other manufacturing areas also could pose serious health risks to workers in the absence of protection from chemicals and other pollutants inside factories.

Figure 10: Sectoral Trend in El Salvador's Imports, (in $'000s, 1999–2003)



Source: International Trade Center Trade Database.

Another way to look at trade performance is to see if there has been a trade-induced shift toward cleaner or dirtier production. Manufacturing industries can be classified into

"clean" and "dirty," and their trends observed over a period of time. Mani and Wheeler (1998) developed a classification to distinguish dirty and clean industries, and this has often been used in the literature. While this method is clearly not ideal, its strength lies in the fact that the set of dirtiest manufacturing industries appears to be fairly stable across countries and pollutants.[56] When we look at the fastest-growing sectors in terms of exports in El Salvador (see Table 7) we find that some of the fastest-growing export industries in El Salvador are also more water polluting (see Annex II for a list of most dirty industries). This is indeed an alarming trend given that water pollution in El Salvador has already reached quite high levels, affecting not only the natural environment, but also sources of drinking water (see Box 14).

Table 7: Fastest-Growing Export Sectors, 1999–2003

Sector	Percentage Change
Beverages	99.0
Paper	62.7
Iron and steel	59.6
Furniture	59.5
Fabricated metal products	56.6
Plastic products	51.5
Transport equipment	51.2
Wearing apparel	40.2
Industrial chemicals	39.1
Paper board, cut paper	26.4
Leather and footwear	26.2

Source: International Trade Center Trade Database.

Box 14: Water Pollution and Health Damage

It is estimated that 90 percent of the surface water bodies are contaminated in El Salvador. Ninety-eight percent of municipal wastewater and 90 percent of industrial wastewater is discharged into rivers and creeks without any treatment. Physical and chemical pollution of water sources used for drinking water supply are frequently contaminated by aluminum, lead, manganese, iron, and nitrates. It has been estimated that the economic impact of contamination through pathogens on human health is $140 million per year, borne mainly by the poorest segments of society. While there is no systematic monitoring of water resources quality, pollution through nitrates, lead, and heavy metals is reported to be quite severe in many regions of the country.

Source: REDI (2004).

In terms of the implications of DR-CAFTA, it is expected that the textiles and garment sector would receive a considerable boost (see Table 8). There is considerable cross-country evidence that shows that bleaching and dyeing production processes carried out in garment factories is responsible for considerable pollution of air, soil, and surface and groundwater. These industries are also frequently water- and energy-intensive and

[56] The approach is based on categorizing industries on the basis of their emissions intensity (emissions per dollar of output) and computing average sectoral rankings for conventional air, water, and toxic pollutants (Mani and Wheeler 1998).

involve the use of chemicals and solvents, and they all have an impact on the environment. Thus an expansion of the sector (in the absence of adequate pollution controls) could result in increased levels of pollution and waste. Currently, there exists no clear legal framework or accountable institutional arrangement to address severe pollution problems (see Box 15).

Table 8: Estimated Effects of U.S. Tariff Elimination on Major Salvadoran Exports

Product Description	Percentage Change (expected)
Articles of apparel, clothing	36.4
Manmade fibers	37.5
Other made-up textile articles	25.7
Footwear	38.8
Articles of leather	42.4
Man-made filaments	28.4
Knitted fabrics	52.2
Cotton	17.4

Source: World Bank (2005).

Box 15: Weak Institutional and Legal Frameworks

Some of the fastest-growing export industries in El Salvador are also the most water polluting, and this trend is expected to continue and expand with DR-CAFTA. The resulting hydrological, ecological, and economic consequences could be significant. Not only would they cause irreversible damage to already stressed resources, but they will affect downstream freshwater, coastal, and marine resources, and communities, and often the poor, who depend on these resources.

Managing the environmental dimension of water is essential to sustain the basis for economic development, growth, and poverty reduction. Environmental objectives, however, cannot be managed separately from consumptive objectives. Both must be integrated into water policy reforms, water resources planning, and management decision making. Environmental impact assessments are useful tools for predicting impacts of large infrastructure projects, but these impacts are often not managed because of inadequate water policies, absence of guidelines, capacity constraints, and lack of commitment and political will. Accordingly, countries need to adopt a framework that provides incentives for ensuring that water resources planning, development, and management includes environmental considerations.

In El Salvador, the water management institutional framework is characterized by a high number of entities at the national, regional, and local levels, poor policy coordination, and overlapping responsibilities. The water resources sector suffers from weak accountability and lacks transparency.

There have been many attempts to update this law, and recently a draft law with many good, modern aspects has been prepared with the participation of different entities of the central government (mainly MARN and ANDA). Because 2006 is a political transition year at the municipal level, it has been decided to delay congressional action on the law.

There is no national policy or strategy on water resources management and development. The authorities have been mainly focused on sectoral users, particularly irrigation and water supply infrastructure. However, due to increasing scarcity, water resources are coming to the forefront of the political agenda.

The lack of a water resources management policy and strategy has hindered good water resources management practices and concentrated efforts on supply-side solutions to resolve the problems. The lack of a policy or strategy, and the increasing demands, have resulted in increased competition for scarce water resources and a higher probability of conflicts among the different sectors. In addition, all stakeholders are rarely involved in the decision-making process regarding water resources management and water project preparation and implementation. Finally, the impacts upstream and downstream are often not adequately

considered, reflecting the lack of an integrated approach and long-term planning among the authorities. Accordingly, El Salvador needs to adopt a framework that provides incentives for ensuring that water resources planning, development, and management includes environmental considerations.

5. Meeting Technical Requirements of Trade

In agriculture, many of the benefits from DR-CAFTA for El Salvador are expected in higher value-added agroindustry. The Ministerio de Agricultura y Ganadería (MAGES) recently released a detailed analysis of 28 agricultural commodity groups in order to evaluate each group's position under DR-CAFTA. The report identifies 10 groups in El Salvador that have potential to gain from the agreement. These are vegetable oils, sesame seeds, indigo (*indigofera anil*), sugar, cacao, sausages, honey, nuts, seafood, and ornamental plants and flowers. While the guaranteed market access provides the opportunity for growth in these areas, the document notes numerous barriers that could limit the benefits of DR-CAFTA. Small producers, especially, could face significant problems related to meeting sanitary and phytosanitary (SPS) and technical barriers to trade (TBTs) compliance requirements because of increasing concerns about food safety, stricter SPS requirements in trade, and competitiveness in export markets. Under DR-CAFTA, the chapter on SPS measures aims to enhance implementation of the WTO Agreement on the application of SPS measures with the objective of harmonizing and standardizing SPS measures and processes in DR-CAFTA countries.

While both measures are broadly designed to protect the environment to the extent it relates to plant, human, and animal health, the SPS agreement relates primarily to questions of food safety, and the TBT agreement covers technical standards for all products, industrial and agricultural. SPS measures refer to measures designed by consuming countries to:

- Protect human and animal life from risks arising from additives, contaminants, toxins, and disease-causing organisms in food.
- Protect human life from diseases carried by plants and animals.
- Protect animal and plant life from pests, diseases, and disease-causing organisms.
- Protect an importing country from the entry, establishment, and spread of pests.

TBTs, on the other hand, cover the range of aspects linked to product quality, nutritional content, labeling, and methods of analysis not directly covered by the SPS agreement. Together, the SPS and TBT agreements cover the full range of food-related standards, including quality and safety, and other areas such as labeling, consumer protection, biotechnology, food irradiation, and the production of "organic" foods.

The impact of specific SPS measures can be expected to depend on the safety level or quality standard specified, and on the form of its regulatory mechanism (such as product, process, or performance standards). From the Salvadoran perspective, the food industry (such as vegetables, fruits, livestock, and poultry) 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. For example, in the last year alone, the U.S. Food and Drug Administration refused over 50 products from El Salvador from entering the U.S. market for violating the Food, Drug, and Cosmetic Act for various reasons ranging from labeling to processing requirements. While the refusal rate for Salvadoran products appears much less than for some other countries (it depends on the volume as well), this could cause increasing impediments to exporters as DR-CAFTA takes effect and trade barriers are further removed.

Not only for El Salvador, but for most developing countries, problems in complying with SPS and TBT requirements reflect their wider resource and infrastructure constraints that limit not only their ability to comply, but also their ability to demonstrate compliance. A particularly acute problem is access to appropriate scientific and technical expertise. In many developing countries knowledge of SPS and TBT issues is poor, both within government and the food supply chain, and the skills required to assess SPS measures are often lacking.

A recent study evaluating capacity for compliance with SPS requirements was undertaken by the USDA for all DR-CAFTA countries (USDA 2004). The study looked at three areas: legislative and institutional issues, facilities and equipment, and documented procedures. In terms of legislative and institutional issues, the study indicated that although El Salvador is equipped with sufficient training programs and inspection service and risk analysis staff, it lacks sufficient laboratory support staff and managers to carry out the necessary functions for compliance with SPS agreements. Also, the study identified discrepancies between the national legislation and the requirements of the WTO SPS Agreement to insure compliance. In terms of facilities and equipment, the study indicated an insufficient number of laboratories and technology for diagnosis and inspection. A number of gaps were also identified in procedural issues, including identification, documentation, and certification procedures in accordance with international standards. Although El Salvador has a national plan for enhancing knowledge and adaptation of SPS measures, its implementation seems far from complete.

The findings of this study were also reinforced by a survey undertaken for the Country Environmental Analysis. In addition to inadequacy of staff and equipment, it identified institutional weaknesses and limited coordination among national standards institutes, the Ministry of Agriculture, environmental protection agencies, and other advisory and certifying bodies, leaving gaps in the system. Also, the survey further identified the urgent need to put in practice the “Environmental Cooperation Agreement,” prescribed in DR-CAFTA framework.

Experience from around the world suggests that a more proactive stance by the government in promoting the new standards on both a sector’s major input providers and exporters can go a long way toward bringing them into compliance with international standards (see Box 16).

Box 16: Getting Small-scale Firms to Comply with Global Standards

The recent proliferation of nontariff technical barriers in the form of global standards has unleashed a debate around the question of how and under what conditions supplier firms in developing countries, especially firms in polluting industries such as leather and textile processing, dyes, and chemicals—which are also large employers—can comply with the increasingly stringent environmental standards imposed by global buyers without compromising their export and cost competitiveness. In this context, a recent study by Tiwari and Pillai (2004) analyzed the Indian leather industry's relatively successful compliance with two trade-related environmental regulations imposed on it by Germany, India's largest buyer of leather goods, when it abruptly banned PCPs (pentachlorophenol) and Azo dyes in the 1990s.

In contrast to standard approaches to enforcement based on command-and-control mechanisms or monitoring and sanctioning end users (the small leather-processing firms and small textile-dyeing firms in this case), the Indian government targeted a much narrower and more visible segment of the supply chain—the leather chemical input industry that produced the banned chemicals. By passing a law to ban the import and production of PCPs and Azo dyes in India, the government effectively, though inadvertently, turned an input industry (the leather chemical companies) into de facto diffusers of environmental compliance among a sprawling network of small-scale end users of their products. Forced to shift to safer dyes, the chemical companies, which initially vigorously opposed the government's ban, began experimenting with the development of substitutes and then launched efforts to market them broadly to their primary clients—the small leather-tanning and textile-processing firms, just the firms that needed to comply with the German legislation and that the State's enforcement apparatus would have found difficult to individually monitor.

This creative targeting of an input industry by the State indirectly shifted the impetus of enforcement from government agencies to a segment of private industry, thereby making a major difference in the extent and speed of environmental compliance.

Source: Tiwari and Pillai (2004).

6. Foreign Direct Investment

The opening of the economy in El Salvador has been accompanied by a steady increase in foreign direct investment (FDI). During 1997–2002, foreign investment flow amounted to $2.3 billion. Foreign investment often brings modern technologies, which are likely to be cleaner than older versions. At the same time, there is much discussion in the literature that this may create "pollution havens," particularly in certain resource-intensive sectors. The main justifications for this view are that strong environmental regulations drive up production costs by requiring certain equipment and by prohibiting certain inputs and outputs. Therefore, it is obviously in a firm's best interest to locate its production facilities in a country with lower production costs if the firm has the choice of location. This argument focuses solely on the cost effects of environmental regulations and presumes that production cost differentials are a sufficient inducement for a firm to relocate its production facility.

Evidence from around the world, however, is actually to the contrary. A number of multinational investors are in fact concerned not so much about the stringency of environmental regulations as about incomplete or inconsistent regulations that created uncertainties with regard to their (global) environmental responsibilities, and unequal enforcement that prevents a level playing field. Having transparent and consistent regulatory structures for environmental protection is therefore seen as a precondition for making informed investment decisions and for attracting reputable, strategic investors.

In fact, the investment provisions underlying DR-CAFTA have come under considerable scrutiny, particularly in terms of its implications for environmental regulations. Many critics of DR-CAFTA allege that its investment chapter contains provisions that allow foreign investors to challenge legitimate laws and regulations and demand monetary compensation for the implementation of legitimate environmental protection (Gallagher 2005).

It is thus of interest to observe investment trends to see how they have evolved over the last few years. As seen in Table 9, in addition to the electricity and communications sectors, FDI inflows went into manufacturing, maquila, and financial services. The United States continues to be a major investor followed by Mexico and Venezuela. U.S. FDI increased 25 percent since 2001 (up to mid-2005) and accounts for 31 percent of total FDI received by El Salvador. The fastest-growing investment category has been the apparel and clothing maquila industry, in which companies from the United States and other countries ship cut cloth to plants in El Salvador where they are sewed into finished garments for reexport, principally to the United States. This is expected to expand further under DR-CAFTA.

Table 9: Foreign Direct Investment in El Salvador (in millions of US$)

	2000	**2001**	**2002**	**2003** 1/	**2004** 2/	**January–June/05**
1. Industry	337	401	448	479	521	538
2. Commerce	169	190	226	251	290	301
3. Services	70	90	109	111	122	124
4. Construction	12	12	12	12	12	12
5. Communications	291	353	401	411	748	748
6. Electricity	807	822	848	848	848	848
7. Agriculture and Fishing	10	40	49	52	77	81
8. Mining	0	0	0	0	0	0
9. Finance and Insurance	120	162	174	190	193	268
10. Off-shore Assembly (maquila)	157	183	193	263	302	311
Total	**1,973**	**2,252**	**2,460**	**2,617**	**3,113**	**3,231**

Source: Central Bank of El Salvador.

The environmental implications of the increased FDI flows are not clear in the absence of more detailed data. It is not obvious whether lax environmental regulations are a reason for attracting foreign investment. FDI in some sectors could be bringing in much needed cleaner and environmentally friendlier technology. On the other hand, in the absence of adequate regulations and enforcement, this could create enclaves of pollution and waste. The survey conducted for the CEA indicates no specific arrangements to monitor environmental performance of multinational enterprises. This is of concern in free-trade zones. There are no provisions governing the environment in these areas except a

provision that states that production or storage of merchandise that causes pollution or damage to health or the environment is not eligible for the standard privileges obtainable in these zones. However, the Government of El Salvador could use this opportunity to create the right incentives for conducting operations in an environmentally sound manner. These findings were also reflected in a recent Inter-American Development Bank study on "Competitiveness Analysis and Environment for El Salvador." The study focused on environmental aspects more relevant to the country from the perspective of its potential impact on competitiveness, and in this context evaluates the most important challenges and opportunities for El Salvador (see Box 17).

Box 17: Competitiveness and the Environment

The successful incorporation of environmental factors into El Salvador's competitive structure will make the country's investment climate more attractive to foreign investors, will orient the agriculture and industry sectors toward more valuable markets, will reduce the pressure of the productive sectors on the base of the natural resources, and will offer new commercial opportunities in the worldwide markets. To create new opportunities for development for El Salvador, it is fundamental that the environmental institutions work suitably, so that the investments and the growth of the productivity occur in all the sectors of the economy, but especially for the development of comparative advantage in industries, and in new productive options that are based on the sustainable operation of the natural resources. El Salvador needs to improve the current "environmental ranking" it is assigned by the World Economic Forum's Environmental Sustainability Index. To do this, it is essential to improve the quality and credibility of Salvadoran environmental regulations, preferably supported by standards recognized worldwide. The productive sector of the country, both exporting companies and the producers for the local market, must incorporate better environmental performance into their strategies, not only to foment productivity and the efficient use of the resources, but also to obtain better positioning in the markets.

Source: IADB (2005).

7. Conclusions and Policy Recommendations on Trade

El Salvador's integration into the international economy has increased significantly over the past decade aided by substantial trade liberalization, and appears set to increase further as trade-expanding measures of DR-CAFTA take full effect. This rather dramatic shift in El Salvador's trading patterns has important implications for the environment and use of natural resources. Though the precise environmental impacts of the various bilateral, regional, and multilateral trade liberalization programs undertaken are often difficult to anticipate, this study attempts a more systematic analysis of the trading and investment patterns to give a broader understanding of the environmental implications of greater openness of the economy.

We conclude from our analysis that there has been a change in composition of output in El Salvador that parallels the gradual opening up of the economy. Manufacturing output and exports are now significantly higher, increasing, and in sectors that are pollution intensive. FDI is also shifting to some of the pollution-intensive sectors. This story is, on the surface, consistent with what would be expected looking at the trend of Salvadoran exports and FDI, though El Salvador still remains a net importer of pollution-intensive goods. While much of the industrial story is in sectors that are water-pollution intensive, automobiles seem to be responsible for much of the air pollution. There is a considerable import of second-hand automobiles, which poses imminent danger to health and the environment.

In El Salvador, the most likely source of agricultural growth is in higher-value-added agroindustry (IADB 2004). Productivity in traditional crops has stagnated and even declined. Rural areas could realize large gains by switching out of food staples and other traditional crops and into nontraditional production. El Salvador, however, faces a number of obstacles to its export promotion agenda because of increasing global concerns about food safety, stricter SPS requirements in trade, and competitiveness in export markets. Recent survey-based evidence indicates that there is no national legislative requirement for the identification of new pests in the country (to be reported to the national organization) or for survey of crops on a regular basis, no documented procedures for certified alterations, security over official seals, or consignment identification, and no approved set of guidelines or standards for undertaking risk analysis that is consistent with the WTO SPS Agreement. Some of these could be in the way of meeting WTO/DR-CAFTA SPS requirements. This would require developing both process-related and practical approaches to meeting global standards in terms of technology and certification standards. Capacity-building needs for various Departments and ministries cannot be overstated. Even though agriculture is relatively less important in El Salvador's GDP, a significant reorientation of the sector to focus on high-value crops could result in large gains for rural areas.

To make specific policy recommendations on future steps, we need to identify the manufacturing sectors that have resulted in the greatest increase in water-pollution-intensive exports. Annex II shows the important water-pollution-intensive sectors are: iron and steel, nonferrous metals, industrial chemicals, rubber, and leather products. These sectors are also considered significant contributors to toxic pollution, and consistently rank high based on the Linear Acute Human Toxic Intensity (LAHTI) index (Hettige and others 1994). Analyses of Salvadoran exports show that the sectors that have the highest increase in exports are: beverages (90 percent), paper products (62 percent), metal works (56 percent), plastic (51 percent), and textile and garment products (40 percent).[57] Of these, the textile industry is also a large consumer of industrial chemicals (40 percent). Obviously, there has been a notable shift in the composition of exports and production toward more water- and toxic-pollution sectors.

Proper management of the country's natural resources, such as water resources, is vital to the sustainability of these exports. This requires support of national and regional water management strategies, policies, and plans to be able to coordinate and increase effectiveness, efficiency, sustainability, and productivity in the use of hydrologic resources. There is thus an immediate need to reform the water sector to make it economically viable and environmentally sustainable. This could include raising tariffs adequately to reflect the externalities associated with both water use and wastewater, improving collection efforts, and rehabilitating existing infrastructure. From an environmental policy point of view, the challenge is to strengthen environmental institutions and policies so that they protect the environment and the country's natural patrimony in an effective way, and at the same time support trade-driven growth (see Box 18).

[57] International Trade Statistics, ITC: http://www.intracen.org/menus/countries.htm.

These findings suggest that while trade liberalization measures have been pursued to promote economic growth in El Salvador, they may have led to some potentially adverse environmental consequences. These results suggest that there is a tradeoff between the economic gains from liberalization and the environmental consequences from a liberalization episode not accompanied by a simultaneous strengthening of environmental policies. This study highlights the need to consider strengthening environmental policies at the time when further trade liberalization is happening through DR-CAFTA.

Better environmental performance is also often seen as synonymous with improved quality control of final products, and of improved operating efficiency with less resource use and less waste, leading to increased profitability. 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.

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

Box 18: Policy Recommendations

Industrial pollution needs to be tackled head-on because growing pressures from trade expansion and privatization could further worsen the situation. Currently, there is no clear legal framework or accountable institutional arrangement to address severe pollution problems. There is a need for more flexible and efficient regulation beyond the Environmental Impact Assessments that nevertheless provides strong incentives for polluters to change their ways. To achieve this, steps have to be taken to:

- Prevent pollution at the source.
- Encourage, develop, and apply the best available practicable technical solutions.
- Ensure that the polluter pays for the pollution and control arrangements.
- Focus protection on heavily polluted areas and waterways.
- Involve the public in decision making.

Introduction of an effluent charge system should be considered, which will set specific limits to encourage the minimization of waste, and promote recycling and reuse of materials and conservation of natural resources, particularly water. Most existing polluting industrial processes should be subject to these provisions (particularly those using toxic substances), and the new facilities will have to conform to stricter standards. The effluent charges should not merely be a regulatory tool, but a mechanism to promote technological upgrading to prevent pollution, conserve resources, and regulate waste. Codes of practice and guidelines should be evolved for specific processes.

Strategies should be developed for areas with high pollution loads where the cumulative effects of the various types of pollutants should be taken into account including pollution of groundwater. This should include location-specific standards for stringent environmental quality objectives. Small-scale industries must be provided assistance to implement pollution-control measures. Especially, cluster of small-scale industries in key sectors (e.g., food processing and others) can improve their environmental performance through better adjustment to trade related regulations with assistance from the government and international multilateral and bilateral organizations.

While regulatory measures remain essential for the effectiveness of the policy, new approaches for considering market choices should be considered. Market-based instruments such as pollution taxes or 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.

The public must be made aware of environmental risks, the economic and health dangers of resource degradation, and the real cost of natural resources. Information about the environmental performance of facilities and areas should be published periodically. Affected citizens and NGOs can thus play a role in environmental monitoring; therefore allowing them to supplement the regulatory system will also be cost-effective.

The increasing flow of FDI provides an opportunity to create the right incentives and conditions for introducing environmentally sound business practices. In particular, this calls for further improvements in environmental standards in the specific growth industries identified, to protect natural assets and public health, and to assure foreign investors concerned about corporate responsibility, particularly for the future development of the industrial and agricultural sectors.

Since many of the gains in agriculture from DR-CAFTA are going to come from nontraditional areas, guaranteed market access would require implementing better technology and sanitation measures and improving disease prevention and control programs. Implementation of SPS measures would not only require building technical capacity, but also improving coordination across various agencies involved and reinforcing control, inspection, and certification procedures.

8. Infrastructure Expansion

In infrastructure, the government has recognized the need for an ambitious agenda that spurs growth on the basis of a second generation of reforms and investments. In the 1990s, El Salvador's reconstruction program benefited from relatively high levels of expenditure in infrastructure (2 to 3 percent of GDP), private sector investment in power and telecommunications, rapidly expanding connectivity in all utilities, and the creation of a strong road maintenance program. In parallel, major reforms were initiated in power, telecommunications, roads, and port services. Since 2001, however, infrastructure investment has fallen sharply both as a percentage of public investment (46 percent in 2001 to 30 percent in 2004) and as a percentage of GDP (2.8 percent to 1.2 percent), with the largest drop corresponding to the provision of water and sanitation (DPL II).

To increase infrastructure investments and achieve needed growth, the government faces several challenges, including: (a) addressing shortfalls in the provision of basic social infrastructure, such as water and sanitation; and (b) improving logistics infrastructure and services to facilitate export competitiveness. During 2001–04 coverage rates for water and sanitation service declined each year, with poor and rural households most affected by the inadequate provision of social infrastructure. In addition, although the highway network was greatly expanded in the 1990s, local producers and exporters are restricted by the current transport system's regulatory practices and logistics bottlenecks. Competitiveness is hindered by the high costs of trucking services, warehousing, and ocean-borne shipping tariffs, and indirect costs caused by delivery delays and lost cargo.

Given these challenges, the government is currently assessing its infrastructure agenda in terms of budgetary, poverty, and growth impacts, service access, and performance of providers. The Bank, through the Recent Economic Development in Infrastructure Report (REDI), is providing the government with a resource guide and policy aide for the development of its infrastructure development agenda. This Bank report offers a comprehensive assessment of El Salvador's electricity, telecommunications, transport

(roads, ports, airports, and urban transport), and water and sanitation sectors. Preliminary findings from the REDI are contributing to an agenda centered on second-generation reforms, which are expected to rely in the early stages on strengthening regulatory frameworks and institutions, and on leveraging the private sector for new investments and more efficient operations.

Key government priorities include the concessioning of the port of Acajutla and cargo operations at Comalapa Airport, development of a new deep-sea port (Cutuco), and empowerment of the newly created regulatory agencies for the maritime and aviation sectors. In roads, the government intends to continue to improve the main road network under the Road Maintenance Fund (FOVIAL) program and to use donor funds for the development of a northern corridor connecting traditionally poor rural communities with markets. In water, plans are underway for clarifying roles and responsibilities of the many agencies involved in the sector and adopting new legislation to decentralize and open markets by promoting participation by communities and public-private associations. In energy, the priority is to strengthen the institutional capacity of the Superintendent of Energy and Telecommunications (SIGET), review the framework under which the electricity market is currently working to ensure competitive and fair pricing, and develop plans for the regional interconnection of the Central American grid (DPL II)

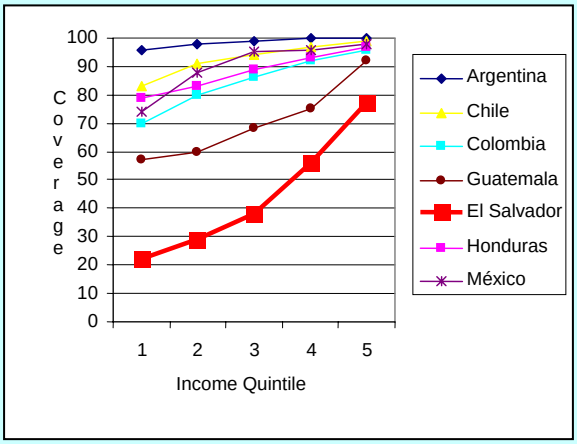
The expansion and improvement of infrastructure included in the government's plans will have substantial social and economic benefits, but may also have significant environmental effects, including: (a) disruption of natural drainages and groundwater supplies; (b) erosion, sedimentation, and other downstream effects; (c) land use changes, including those resulting from impacts that infrastructure might have on industrial and population growth and distribution; and (d) induced urban development, including informal settlements along vulnerable corridors. Boxes 19 and 20 present the environmental challenges faced by the water and sanitation and transport sectors. Given these challenges, it is important to review the country's legal framework and institutional arrangements for managing and mitigating the environmental impacts of infrastructure programs and investments.

Box 19: Water and Sanitation

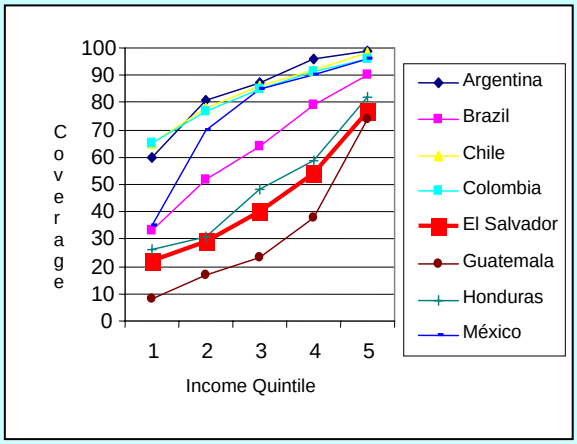
Water pollution is a significant problem that affects El Salvador's water resources and limits both their use as a water supply and their ecological benefits. Approximately 90 percent of industrial toxic waste and 98 percent of municipal wastewater is discharged into water bodies without prior treatment or control. The Lempa River Basin and its tributaries, the Suquiapa, Acelhuate, and the Quezalapa Rivers, are highly contaminated as a result of the direct discharge of untreated effluents, and it is estimated that 90 percent of surface waters are contaminated. The highly contaminated Acelhuate and Sucio Rivers are responsible for providing a third of the San Salvador metropolitan area's water supply. In addition, the inadequate disposal of solid waste results in leachates with high concentrations of toxic residues. This problem is compounded by a lack of solid-waste-collection services in more than half of the country's municipalities.

Although the country achieved significant advances in water supply coverage during 1990–2002, with coverage increasing from 67 percent to 82 percent, this expansion has been stalled with zero or negative growth since 2001 due to a lack of financing for infrastructure works in this sector. Sewerage coverage reached 43 percent in 1995, but has since declined to 40 percent. There is also a significant disparity in the coverage of basic services between urban and rural areas, with coverage of 91 and 68 percent, respectively, and in income levels (see Figure 11). In fact, despite having a greater population density than its Central American neighbors, El Salvador's rural coverage is lower than that of Guatemala and Honduras, and urban coverage is lower than Honduras and Nicaragua.

Figure 11: Equity of Basic Services Coverage



(a) Water



(b) Sanitation

Lack of basic services coverage impacts not only the quality of life of the rural population, but also their health and productivity. The rural poor dedicate a significant amount of time to collecting water, with those without coverage spending on average 9 percent of their productive time collecting water, and the extreme poor spending on average 14 percent of their time doing so. In addition, given that water supply provision is often intermittent, or not provided during periods of drought, even those with coverage often spend up to 5 percent of their productive time collecting water. This lack of social infrastructure coverage translates into a situation in which nearly half of all homes lack water connections and two-thirds of the population lack sewerage. Low coverage of basic services in rural areas has also resulted in serious health problems. The child mortality rate in homes without service connections is approximately 40 deaths per 1,000 births, and in homes with connections it is approximately 30 deaths per 1,000 births. The economic impact of these health impacts has been estimated at US$89 million per year.

Expansion of water and sanitation supply is expected to benefit public health, the environment, and the economy, with investments expected in the areas of sanitation, wastewater treatment, and reduction in water losses. Increased sanitation coverage is expected to have a positive impact on public health; municipal wastewater treatment is anticipated to benefit the environmental quality of El Salvador's highly polluted reservoirs; and a reduction in water losses will alleviate investment requirements. However, some of the country's planned investments could be harmful to the environment. For example, the government is considering construction of a water supply system, at an estimated cost of US$70 million, to provide an additional water supply of 1 to 2 cubic meters per second. This additional supply corresponds to the current deficit estimated by the National Water and Sewerage Administration (ANDA), which also considers this investment less costly than other investment alternatives, such as reducing current losses. However, detailed studies comparing the costs and benefits of the planned investment with other alternatives are not available.

Box 20: Transport

The transport system in El Salvador is comprised of a network of roads, the port of Acajutla, an international airport (Comalapa), and a domestic and military airport (Ilopango). Transport-related activities, such as construction, management, and operation, contribute more than 11 percent of GDP. In addition, the sector generates approximately 240,000 jobs. The transport sector is critical to the country's economic development and competitiveness. As such, the country's investment program for 2004–09 calls for US$1,201.5 million in investments that include construction of a highway that will encircle San Salvador, regional bypasses, and the port of Cutuco.

With the recent reforms of the roads subsector, the country's road network was greatly improved. These improvements included the construction of over 1,466 kilometers (km) of principal highways, the reconstruction or improvement of 162 bridges, and the paving or repaving of 826 km of rural roads. The percentage of paved roads increased from 25 percent in 1999 to 51 percent in 2004 and the percentage of roads in poor condition decreased from 37 percent in 1999 to 15 percent in 2004. However, the country's increasing population and density pose future challenges for the management of the country's road network. Automobile usage has grown twice as fast as GDP, resulting in travel delays and increased theft as trucks sit in traffic. In addition, the majority of the country's trucking fleet is over 15 years old. Local producers and exporters are burdened most by the cost of travel delays, which result in higher costs for warehousing and in reduced sales. Projects that address both decongestion and demand management will be needed in the future.

To address shortfalls in the provision of social infrastructure, the REDI recommends two key policy initiatives: (a) subsidy redesign to ensure that the poor are primary beneficiaries of taxpayer transfers; and (b) water sector reform to provide the sector with a sound and sustainable financial footing and enable utilities to both invest and operate efficiently. Currently, the poorest 40 percent of the country's population is receiving only 29 percent of yearly basic service subsidies. In the water sector, hundreds of thousands of households are currently without connections, and the national utility is financially unable to serve all of the country's connected households. In addition, current tariffs do not cover operation and maintenance costs. With respect to the logistics bottlenecks faced by El Salvador's producers and exporters, the REDI recommends regulatory improvements in the following areas: (a) updating the Highways Law, (b) developing a new strategy for road development to identify and develop key logistics corridors and to improve standards and design, and to improve supervision of road conditions; (c) developing the longitudinal north road as a secondary road to improve connectivity; (d) developing an overall strategy for the ports sector, establishing complementary roles for the Acajutla and La Unión ports; and (e) establishing a regulatory framework for trucking services.

9. Managing the Environmental Implications of Infrastructure Expansion

In El Salvador, the primary instrument available to manage the environmental implications of infrastructure expansion is the Environmental Impact Assessment (EIA). This tool, however, is overburdened and unable to manage the environmental implications of the country's current projects. The EIA system lacks a clear definition or categorization of projects that require environmental assessments. Under article 21 of the Environmental Management Law, MARN requires an EIA for any proposed project "that might have considerable or irreversible impacts on the environment." Without clear criteria to categorize those projects considered to have significant impacts, a

comprehensive environmental assessment is often required for an investment that has limited, site-specific impacts. In addition, MENA provides standard, sector-specific terms of reference (TORs) to project proponents of those activities requiring an environmental assessment, irrespective of the project's expected environmental impacts (that is, two road construction projects, one with minimal impacts and the other with extensive impacts, would be provided the same TORs for an EIA).

These standard requirements are not only cumbersome for project proponents, but also for the Ministry, which is required to review each EIA report. Three-hundred to 400 EIA reports are submitted to the Ministry for review each year. Given the limited number of MARN staff assigned to review these reports (10 staff), it is difficult for the Ministry to comply with Decree No. 233, which calls for reports to be reviewed in 60 days. There is currently a backlog of over 2,500 EIAs, and the EIA review period can take up to two years. Added to this challenge is the fact that almost all of the EIA reports that the Ministry reviews are returned to project proponents with observations. This indicates that the TORs do not provide project proponents with sufficient guidance on the EIA requirements. In addition, only two staff within the Ministry are assigned to oversee and monitor the implementation of Environmental Management Plans. As such, responsibility for monitoring and oversight is often left to the investor, creating the risk that these plans will not be reviewed or carried out adequately.

The current EIA system should be modified so that only those projects with significant adverse environmental impacts that are sensitive, diverse, and unprecedented are subjected to an extensive environmental assessment. This will entail establishing sectoral criteria to clearly categorize the types of projects considered to have extensive impacts, more limited impacts, and minimal impacts. Rather than a one-size-fits-all approach for the TORs provided for sectoral EIAs, the TORs for the environmental assessment should then be tailored to the anticipated impacts and required mitigation measures so that the environmental assessment can be more effectively used as a decision-making tool. Depending on the project, the TORs could call for the use of a number of different environmental assessment instruments (for example, an Environmental Impact Assessment [EIA], a regional or sectoral Environmental Assessment, or an Environmental Management Plan [EMP]). In addition, the project proponent should be provided with sufficiently detailed and clear guidelines to support the preparation of the environmental assessment. As part of this modification to the current system, the new project categorization should also be used to support a prompt review of the existing backlog of EIAs so that proposed projects that might not require a comprehensive environmental assessment are not subjected to excessive requirements.

A number of the country's sectoral ministries have established environmental units that already play a role in the country's EIA process. The Ministry of Public Works (MOP), the Executive Hydroelectric Commission of the Rio Lempa (CEL), and the National Water and Sewerage Administration (ANDA) formed environmental units in the early 1990s, prior to the National Environmental Law. ANDA currently assists MARN in the oversight and monitoring of environmental management plans, and MOP also oversees environmental management plans and plays a role in issuing environmental permits. To

improve the efficiency and effectiveness of the current EIA system, MARN should task sectoral staff with developing sector-specific environmental assessment guidelines and procedures, including criteria to categorize the significance of project impacts and the corresponding assessment requirements. This would help ensure that environmental assessment requirements fully correspond to the anticipated environmental impacts of the project.

Further efficiencies in the EIA process could be gained by decentralizing the following responsibilities, currently undertaken by MARN, to these sectoral ministries: (a) preparation of the TORs for environmental assessment; (b) oversight of consultant's preparation of the environmental assessment, including the environmental management plan; (c) monitoring and oversight of the environmental management plan during the project's implementation; and (d) issuance of environmental licenses. MARN would retain responsibility for overseeing the work of these sectoral environmental units. However, before these responsibilities are shifted to sectoral units, a thorough institutional assessment should be performed. This assessment should determine the institutional strengthening needs of the environmental units and the extent of the responsibilities that would be transferred (that is, not all sectoral units might have the capacity to review environmental assessments and issue permits).

Despite the country's reliance on the EIA system as the primary tool to mitigate environmental impacts, and the urgent need to simplify an already overburdened system, the EIA is not the appropriate tool for addressing all of the environmental implications of infrastructure expansion. One tool that has not yet been employed that would be beneficial in this respect is the Strategic Environmental Assessment (SEA). El Salvador's Environmental Management Law calls for an SEA to integrate environmental considerations in the development and implementation of 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 (see Box 21).

Box 21: Benefits of an SEA

- Provides the necessary framework to ensure 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 for ensuring sustainable infrastructure development that safeguards the natural environment, achieves economic growth, promotes income and employment generation, 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 necessary 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 at the highest level possible in planning or decision making, it can focus on the "source" of environmental impacts rather than addressing symptoms later on. 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 any potentially adverse effects of implementing policies, plans, and programs and can establish a framework for subsequent project-level EIAs.

Given the infrastructure expansion plans in the La Unión region and the construction of the Cutuco port, an SEA of these expansion plans and programs should be conducted to support sustainable land use planning of the region. The SEA should comprise three distinct phases: (a) Phase 1: scoping; (b) Phase 2: strategic assessment; and (c) Phase 3: sustainability framework. As part of Phase 1, stakeholder consultations via meetings and workshops should be conducted to (a) define a vision for sustainable port development that will support a framework for infrastructure expansion in the La Unión region; and (b) identify strategic issues for detailed investigation, such as maintenance of marine ecosystems and habitats, shoreline stability, port access, port city spatial planning, socioeconomics, and institutional arrangements. As the operational body of the country's National Environmental Management System (SINAMA), the Executive Environmental Council (CEMA) could play a leadership role in coordinating this consultative process. Based on these consultations, a final scoping report should be prepared that contains TORs to address the strategic issues identified.

Under Phase 2, separate specialists should assess the strategic issues identified. These specialists should provide a detailed analysis of the existing state of the environment concerning their strategic issue and use this information to identify sustainability objectives and targets. They should also identify indicators that will assist in future decision making and tracking progress toward sustainable development, identify opportunities and constraints that the surrounding environment may place on future port and infrastructure development, recommend guidelines to overcome constraints and enhance opportunities, and recommend a monitoring program to monitor indicators.

Once Phase 2 is completed, the specialist studies should be compiled to prepare a final output—an integrated report or sustainability framework for infrastructure expansion (Phase 3). This framework should include the following for each strategic issue: (a) a brief description of the state of the environment, (b) opportunities and constraints, (c) guidelines for future infrastructure expansion and sustainable port development; and (d) a monitoring program for key sustainability indicators. An additional result of the SEA process should be the building of institutional linkages among key stakeholders that will facilitate cooperative decision making regarding infrastructure expansion. This inter-institutional coordination fostered under the SEA provides an opportunity for CEMA to strengthen its role as coordinating body in the decision-making process. The intended outcome of the SEA process is that recommended sustainability objectives, targets, and indicators will influence infrastructure expansion, port planning, and environmental management processes by ensuring the integration of social, biophysical, and economic aspects early in the planning phase.

V. Conclusions and Recommendations

El Salvador, a small country with limited national resources, needs to grow through its main comparative advantage, which is its strong culture of competitive businesses. To do so, however, the government needs to ensure that the best affordable environmental management is in place to secure sustainable economic development. The benefits of further improvements to the environmental institutional and regulatory frameworks will be substantial not only to facilitate and sustain trade and infrastructure expansion, but in terms of preserving 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 the scrutiny and monitoring by El Salvador's trade partners regarding environmental compliance. Maintaining low compliance rates would add unnecessary friction and raise the regulatory risks for investing in the country.

The solution to these problems will not come from simply scaling-up MARN's current activities by increasing its budget and staff. This study shows that further improvements of El Salvador's existing environmental management framework are required to achieve the following objectives:

7. Improving coordination among the different government agencies with environmental responsibilities and other stakeholders by enhancing the decision-making process and public participation;
8. Adjusting the environmental evaluation instruments, particularly the EIA and SEA, to current development and environmental needs;
9. Complementing environmental evaluation instruments with technical guides and norms;
10. Strengthening the monitoring and compliance framework according to national priorities and DR-CAFTA requirements;
11. Further developing the Environmental Information System (EIS) as a fundamental instrument for decision making, public participation, and accountability; and
12. Determining other medium- and long-term legal and regulatory gaps that need to be addressed to improve environmental conditions and priority setting in El Salvador.

The study suggests that most of these objectives can be achieved in a short time with minor adjustments of the existing framework of environmental management, which are likely to be implemented by executive orders. In the long term, deeper reforms to the legal framework for water and territorial management, 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 recommendations.

1. Improve Environmental Policy Coordination and Priority Setting through Better Functioning of The National Environmental Management System (SINAMA) and the National Environment Council (CONAMA).

1.1 The Need for Better Institutional Coordination

Environmental issues have gained prominence given the impacts of natural disasters and environmental degradation, and thanks to government efforts to address these issues over the past few years. However, environment policy is still too remote from the economic development concerns, priorities, and polices of the government, and from other ministries and agencies. The environmental policy coordination established by SINAMA has been unable to act as a framework to mainstream environmental policies and priorities and to coordinate environmental tools, budgets, and resources across the government agencies. MARN's resources have been overstretched and its agendas dominated by short-term priorities, weakening its planning and driving the capacities of SINAMA. The creation of CONAMA in September 2004 and the required formalization of the functions of CEMA provide an ideal opportunity to improve institutional coordination and to establish a better decision-making process with more public participation.

CONAMA functions as the consultative body of the Ministry with key stakeholders. It includes seven representatives of the private sector and civil society, and the Minister of Environment, who appoints them. Although it may be too early to assess the effectiveness and relevance of CONAMA's advice, the appointment of strong critics of the government's environmental actions may improve transparency and inclusiveness.

The decree that created CONAMA[58] calls for a regulation that would formalize the functions of CEMA, which is in theory composed of representatives from CONAMA, but in practice has included representatives of all the government entities with environmental functions. This regulation has not been issued and these bodies operate in an ad hoc manner.

Therefore, this report recommends that the government strengthen the operational framework of SINAMA (Figure 1) by:

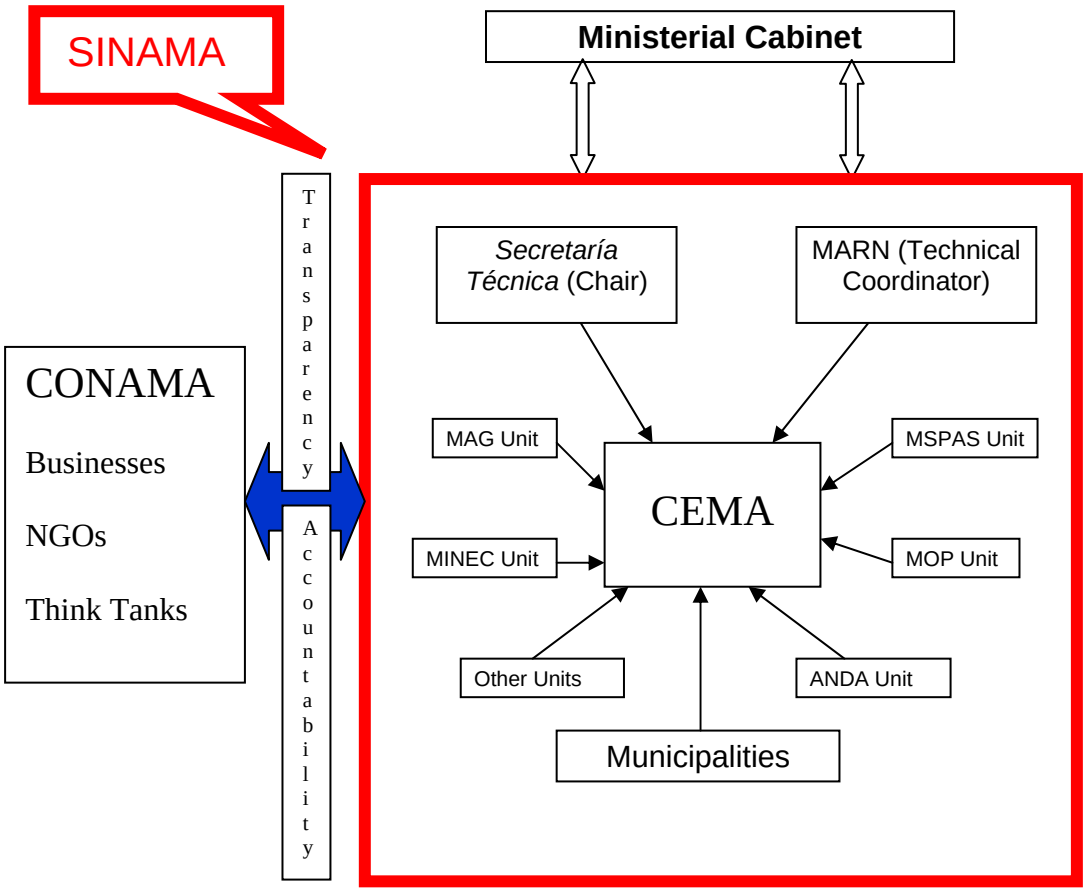
- Formalizing, via decree, the role of CEMA as the operational body of SINAMA, defining the policy decision-making process within CEMA,[59] including the consultation process between CEMA and CONAMA, and the functions and responsibilities of MARN as technical coordinator, including:
    - Formulating the country's environmental policy.
    - Preparing the agenda and follow-up of CEMA monthly (or bimonthly) meetings and CONAMA meetings.

[58] Decree 40 of September 29, 2004.
[59] Colombia's National Environmental System (SINA), which includes the National Environmental Committee and the Advisory Regulatory Council, could be considered as a useful precedent.

    - Providing effective mechanisms to assure information flow among the members of CEMA and CONAMA.
    - Tracking, reporting, and informing on decisions of CEMA (CONAMA is only an advisory body).
    - Drafting an annual report of CEMA and CONAMA activities to be endorsed by these respective bodies.
    - Ensuring public transparency through disclosure procedures of the workings of these bodies, particularly agendas of meetings, advice provided by CONAMA, and deliberations of CEMA.
- Formalizing the role of CONAMA via decree to serve as an advisory board for policy and regulation not only to MARN, but to CEMA as the operational body of SINAMA.
- Supporting the coordination role of CEMA by MARN with the convening power of the Secretaría Técnica to chair efforts for policy development and implementation. Consideration could be given to appointing a special advisor or coordinator for environmental policy within the Secretaría Técnica to assist the Secretario Técnico as chair of CEMA, and to providing a strong convening power jointly with the Minister of MARN on its role as Coordinator of CEMA.
- Encouraging MARN to develop and drive agendas appealing to sectoral ministries, such as on cleaner production for the Ministry of Economy (MINEC) or on energy efficiency for CEL.[60]
- Establishing or strengthening environmental units in the Ministry of Health and Public Assistance (MSPAS), the Ministry of Agriculture (MAG), MINEC, the new Tourism Ministry, and major municipalities.
- Ensuring that, in practice, the functions of existing environmental units (UAs) are broadened from obtaining environmental permits to actively mainstreaming environmental management within each agency.

[60] This "sectoral agenda" strategy has been followed by Mexico and Colombia with significant success.

Figure 12: Key Elements of the Organizational Proposal for Strengthening the National Environmental Management System



1.2 The Need to Clarify Priorities, Establish Quantitative Goals for Each Priority, and Assign Resources Accordingly

El Salvador has developed a number of environmental policies at the national level and on specific issues, helping to raise the profile of environmental issues in the national debate and the public administration, and providing a sense of accountability. However, through time, the increasing number of "priorities" and policies has blurred the focus on key concerns and attainable objectives. This "priority" inflation is particularly damaging in light of the low allocation of the national budget to environmental issues and the concentration of resources on a single instrument—the EIA—inside MARN. Moreover, the budgetary structure does not permit proper follow-up of the current efforts across the whole government. The Ministry appears to be caught under the burden of its daily tasks, without a clear sense of priorities for responding to current and potential environmental challenges.

Based on the above recommendations to improve institutional coordination and functioning of the National Environmental Management System, this report recommends that the government review the national priorities for environmental protection,

sequencing them and providing an appropriate budget to achieve them. The organization and resources allocation of MARN should reflect these priorities. Specific recommendations include:

- Establishing national environmental priorities with quantitative goals. Priorities and goals should reflect major environmental problems and potential environmental pressures associated with increased trade and infrastructure linked to DR-CAFTA. Among these priorities, the following have been identified by recent studies (Panayotou 1998; Strukova 2005):
    - Increasing regulatory compliance.
    - Water quality and quantity.
    - Air pollution (urban air pollution and indoor air pollution in rural areas).
    - Soil erosion.
    - Solid and hazardous waste management.
- Reflecting the stated priorities in the national budget allocation for environmental protection nationally, and developing a "whole of government" accounting system to monitor the use of budgetary resources. Where needed, reassign financial resources and personnel and provide additional sustainable funding, for instance, to tackle environmental health problems related to water quality.
- Reforming MARN's organization, balancing the preeminence of the EIA focus inside the Ministry with reforming of the instrument (see recommendation 5.2), and developing specific mandates, capacities, and staff to monitor and achieve the new priorities.[61]

2. Improve Effectiveness and Efficiency of the EIA System

Like other countries of the region, El Salvador has relied almost exclusively on the EIA as the main tool to develop its environmental management capacity. Currently, in El Salvador, an EIA is required for an open-ended list of activities, and basic standards are absent for facilitating the determination of applicable requirements. Many activities—some of them with standard and predictable impacts—are required to prepare an EIA, and consequently contribute to the serious MARN backlog in licensing. As a result, the process has become a bottleneck for projects. In addition, monitoring and control of the actual impacts of projects in their operation is limited because of the focus on an ex ante tool like EIA without a strong inspection system. Moreover, the new context triggered by DR-CAFTA and the government's very ambitious infrastructure program means that an urgent effort is required.

[61] Currently, most of the resources and attention of the Environmental Management Directorate focus on managing the EIA system.

Box 22. Establishing an Environmental Impact Assessment Task Force

It is of high priority that El Salvador reduce the backlog of existing EIAs and improve the EIA mechanisms and processes in order to use this tool in an effective and efficient way. An Environmental Impact (EI) Task Force could be established to design a process for eliminating the backlog in the next few months and for improving the EIA system. Its mandate and capacities might include:

- Developing, for existing and forthcoming EIAs, a targeted authorization process based on categorizations and standards, and complementary guidelines.
- Determining the steps to efficiently, effectively, and transparently eliminate the existing backlog of EIAs.
- Establishing a short-term EIA Reform Implementation Group (supervised by the Task Force) to carry out the following tasks:
  (i) Reviewing existing EIAs and eliminating the backlog,
  (ii) Developing a website where all the proposed EIAs and accepted EIAs (purged of industrial property information) are posted, and
  (iii) Implementing the reforms recommended by the EI Task Force to improve the EIA process for forthcoming EIAs.
- Undertaking and reporting on the implementation of a Strategic Environmental Assessment project.
- Providing assistance and guidance to businesses.

The EIA Task Force could be composed of three or four professionals to redesign the EIA process within a one-month period, and the EIA Reform Implementation Group might include 10 professionals to eliminate the backlog within a year.

This report recommends that MARN resolve the backlog and reform the EIA process under a targeting approach involving key agencies and private-public partnerships. Measures to improve this tool may include:

- Establishing an Environmental Impact Assessment Task Force under MARN to undertake the reforms (Box 2).
- Introducing a special program to eliminate in the next six months the existing backlog of pending EIAs.
- Reforming the approval process for existing (backlogged) and future EIAs based on an explicit categorization of activities that require an EIA to be assessed and approved by MARN, as follows:
  - Activities that require an EIA to be assessed and approved by a competent environmental unit under the strict guidance and supervision of MARN (see Box 2).
  - Activities that require MARN to be notified and that follow risk mitigation technical standards. Such standards could make explicit the technical requirements, emission limits, and similar instruments,[62] and the activities could be assessed by certified private entities to ensure they conform to the standards.
  - Activities that do not require EIAs (that is, all activities not listed).
- Adopting detailed guidelines for project proponents in preparing EIAs (to complement case-by-case TORs), and adopting detailed criteria for MARN in reviewing EIAs and granting environmental permits.
- Reinforcing the capacities of the MOP and ANDA units to decentralize some authorization powers under MARN's oversight. This oversight could be based on

[62] An example is NSO 75.04.11:03 Productos de Petróleo Estaciones de Servicio [Gasolineras] y Tanques para Consumo Privado. Especificaciones Técnicas, which established the requirements for gas stations.

random ex post inspection of the units' environmental permits and a periodic audit by MARN of the units' capacities and processes.

- Launching a pilot Strategic Environmental Assessment (SEA) project to develop this instrument as a complement to the EIA process, and selecting pilot sectors or regions of the country.
- Complementing the EIA adjustment and SEA implementation with technical guidelines and norms such as contract specifications, and with guidelines to mainstream design and environmental management best practices.

3. Compliance with Environmental Regulations through Enhancement of Inspection and Enforcement Capacities

Although the creation of the Inspectoría[63] is an important step forward, enforcement is one of the weakest aspects of El Salvador's environmental management framework. Due to DR-CAFTA, enforcement is one of the most sensitive issues. This is particularly relevant for compliance issues, which are likely to increase since pressure from trading partners might rise rapidly, as has happened in other free trade agreements. In addition, exporters will further demand better sanitation certification technology and capacity to guarantee market access. Many of the components of an effective enforcement system are already in place and will have an impact (that is, access to proceedings, review, and the courts, citizen complaints, the recently created Inspectoría, and the special environmental areas of the Fiscalía[64] and the National Civil Police, [PNC]), but human, material, and technical resources for enforcement activities (particularly inspections) need to be secured.

More substantially, the focus needs to be shifted from trying to change behavior by threatening with sanctions that are ultimately not enforced, to promoting compliance through achievable requirements that are applied gradually and with flexibility, but with credible sanctions for violators. Improving the legal framework with more precise regulations and standards (as indicated in the previous recommendations) will make compliance and enforcement easier, but those reforms have to take into account compliance from the outset to avoid creating unenforceable requirements. Improving compliance will require time and numerous reforms. An abrupt increase in enforcement without adequate reengineering of the compliance system might seriously affect competitiveness and/or drive businesses toward the informal sector without achieving environmental protection goals.

[63] MARN created the *Inspectoría* in early 2005 to ensure compliance with environmental law. The core idea for this new unit is to strengthen enforcement and compliance through random or programmed inspections. This inspection will replace the current practice of inspecting facilities only in response to citizen complaints.

[64] The Attorney General of the Republic (*Fiscalía General de la República*) investigates and prosecutes crimes. The Fiscalía investigates environmental crimes through its environmental units, and may assist MARN in collecting fines or penalties. The Fiscalía has facilities in four regions throughout El Salvador. The regions and their 13 subregions do not necessarily coincide with the department subdivision, but rather with the particulars needs. The Fiscalía has a small Environmental Unit in each of the four main regions (San Miguel, San Vicente, Santana, and San Salvador).

This report recommends that MARN refocus the enforcement strategy around a Compliance Promotion Program, and through a combination of initiatives and strong monitoring that combines information, technical assistance, financial incentives, and a credible enforcement threat. Some of the key ingredients of such a program are:

- Establishing a Compliance Promotion Program monitored periodically by CEMA to bring the regulated community—including municipalities and other government entities—into compliance. The program might be based on the provision of information and technical assistance, financial incentives, and a credible enforcement threat, and might include an inspection program for unlicensed facilities and a follow-up and audit program for environmental management and environmental adjustment (adecuación) plans of licensed facilities. The Acuerdos de Cooperación Ambiental para la Competitividad currently under development may be incorporated into this program.
- Staffing, training, and equipping the Inspectoría of MARN and strengthening the capacity of the Fiscalía and the PNC.
- Establishing coordination through CEMA and information-sharing protocols between the Inspectoría and the inspection and enforcement departments of other ministries with environmentally relevant functions—ANDA, MAG, MOP, MSPAS, and municipalities. Outcomes of these mechanisms might be reported periodically to CEMA.
- Launching an aggressive sanitary and phytosanitary program to develop standards and to promote private certifying laboratories. Consideration should be given to harmonizing standards with those of countries like Colombia or Mexico to avoid costly redundancy of effort in developing standards.
- Ensuring availability of laboratories to support inspections and evidence gathering by the Inspectoría and the PNC.[65]
- Promoting the creation of independent environmental certification and auditing entities to foster third-party verification in support of government enforcement and voluntary compliance.

4. Better Support for Environmental Decision Making and Monitoring through Improving the Environmental Information System and Public Participation

Environmental information is available at MARN and through its website. However, a system for gathering data on environmental quality periodically and in a format consistent with other national, regional, and international database systems is not yet in place.

This report recommends that MARN revitalize the SIA, which could provide relevant environmental information to support decision making, environmental policy

[65] The *Centro Nacional de Tecnología Agropecuaria y Forestal* (CENTA), under MAG, has a laboratory with qualified people that is open 24 hours a day and is underused, but would be able to perform the analyses required for environmental cases if supplies for this type of analyses were made available.

implementation, and performance monitoring throughout SINAMA and to stakeholders and the general public. Some of the key ingredients of such a program are:

- Developing SIA indicators to be used by government officials to steer policy priorities, for instance, concerning water balances, registry of users, and point sources of pollution.
- Consolidating the SIA by acquiring equipment, adding staff, and providing training, as needed. If appropriate, consider building on National Service of Territorial Studies (SNET) capabilities.
- Improving current water and air-quality monitoring.
- Creating an inventory of wastewater discharges and point-source air emissions.
- Developing a monitoring system to track information on environmental performance of major industrial facilities. Consider publishing the updated data on the SIA website.
- Integrating into the SIA the information already available and regularly received at the Ministry and other government agencies, including studies, professional experience, permit applications, and citizen complaints.
- Launching a systematic, periodic survey of the costs of compliance with environmental laws and regulations to better calibrate the gradual increase in environmental standards and enforcement capacities. The survey could in particular monitor the trade dimensions (that is, costs of exporting and importing) and the infrastructure development aspects.

In El Salvador, the environment is one of the most transparent, open, and accountable sectors. The LMA calls for public consultations on environmental policies and EIAs; the government has created CONAMA, which includes representatives of stakeholders and the public to advise the Minister of Environment on environmental policies, and MARN has a successful citizen complaints mechanism. Nevertheless, transparency and participation still have gaps and weaknesses that need to be addressed. For example, stakeholder participation mechanisms could be made more accountable, transparent, and balanced, particularly with regard to policymaking, EIAs, and draft laws, regulations, and norms. Equity and balance are also an issue: while the private sector has considerable lobbying capacity, participation of nongovernmental organizations (NGOs) and the general public in setting priorities and in rulemaking is less frequent and effective. In addition, lack of follow-up appears to be a generalized problem in consultations with stakeholders, NGOs, and citizens.

This report recommends that the government strengthen the current participation mechanisms with a clearer set of objectives, mandates, rights, and obligations by drafting regulations for the LMA to provide CONAMA with a renewed mandate, rights, and obligations. These may include:

- Introducing public consultation on all draft policies and legal measures (laws, regulations, and norms) with impact on the environment. The consultation period should be at least 15 working days.

- Public disclosure of opinion on the annual reports of MARN, CEMA, and the environmental units of ministries.
- Public disclosure of CONAMA opinions within 90 days of receipt by the above-mentioned bodies.
- Issuing an annual report on the state of the environment.
- Improving consultation mechanisms on proposed policies, laws, regulations, and norms, by organizing workshops or target groups to discuss proposals.

5. Addressing Medium- and Long-term Legal and Regulatory Gaps

The National Environment Law of 1998 (LMA) established a broad basis for building a regulatory framework that might address El Salvador's priority environmental problems. Coherence of the general legal framework must be ensured. The legal framework relies too heavily on command-and-control instruments, including sanctions, as a response to violations, while economic incentives instruments to promote compliance and achieve the desired conduct are not yet in place. Although some key regulations and technical standards have been adopted, legal thresholds have not been set for key issues such as wastewater discharges and air emissions. A framework for sustainable water management is still lacking, despite this being one of the most pressing natural resources issues facing the country. Compliance with the law and MARN's ability to implement and enforce it would improve with a legal framework that takes into account both the regulated community's ability to comply and the government's ability to oversee compliance and enforce the law.

While substantial progress on environmental management can be made by refining and updating regulations and bylaws in the medium to long term, there is a need for additional more detailed and complete legal proceedings, which require longer periods of negotiation and consensus building across multiple stakeholders. They include:

- Completing the legal regime for sustainable water management and for effective water provision providers.
- Completing the legal framework for zoning and land use.
- Resolving the contradictions and ambiguities in the legal framework, particularly those among the LMA, the Health Code, and municipal laws with respect to water, waste disposal, air pollution, and EIAs.
- Developing the law on transparency.

6. Need for a Water Resources Management Framework

In El Salvador, the water management institutional framework is characterized by a high number of entities at the national, regional, and local levels; poor policy coordination; and overlapping responsibilities. The water resources sector itself suffers from weak accountability and lack of transparency. The existing Water Law was approved in 1981,[66]

[66] Integrated water resource management law (*Ley sobre gestión integrada de los recursos hídricos,* D. Ley N° 886, 2 de diciembre de 1981; D.O. No 221. Tomo 273, 2 de diciembre de 1981).

and there have been many attempts to update it, including a recent major effort. A proposed new law with many positive, modern aspects has been drafted with the participation of different entities of the central government (mainly MARN and ANDA).
Up to now, given the lack of a national policy on water resources management and development, the authorities have been mainly focused on sector users, particularly irrigation and water supply. Increasing demand for water, however, has resulted in increased competition for scarce water resources and rising conflicts among the different water-user sectors. In addition, stakeholders are rarely involved in the decision-making process regarding water resources management and water project preparation and implementation. Finally, the impacts upstream and downstream are often not adequately considered, reflecting the lack of an integrated approach and long-term planning among the authorities. Due to increasing scarcity, however, water resources are coming to the forefront of the political agenda.

This report recommends that the government assign priority to reducing the vulnerability of the nation to water issues through a new legal and institutional framework clarifying the roles and responsibilities of all key participants. Principles that may guide this reform process are:

- Centralizing under a single law the management of water resources under the responsibility of MARN. The Ministry, in particular, could set up a special unit in charge of short- and long-term policy. MARN could also be in charge of a centralized registry of water rights and concessions.
- Maintaining and improving the coordination between MARN and the Executive Hydroelectric Commission of Rio Lempa (CEL) working as a river basin that involves the Honduran and Guatemalan counterparts.
- Designing and introducing market-based instruments based on the “polluter pays” principles, particularly establishing pollution standards and pollution taxes and charges for water use to cover, at least, water management functions.
- Strengthening the capacities of departments and municipalities to enforce the legal requirements established under the water management and service providers laws.
- Promoting stakeholder participation by establishing a National Water Roundtable, under the CONAMA structure, to comment on and monitor the application of all policy documents, and draft legal measures involving water resources.

Annex I. Environmental Commitments under DR-CAFTA

Under Chapter 17 of DR-CAFTA, El Salvador and its trade partners committed to the following high levels of environmental protection and effective enforcement of environmental laws:

Environmental Protection

- Provide for high levels of environmental protection.
- Each Party may establish and modify its own levels of domestic environmental protection.
- Strive to continue to improve environmental laws and policies.

Effective Enforcement

- Refrain from failing to effectively enforce its environmental laws, through a sustained or recurring course of action or inaction, in a manner affecting trade between the Parties.
- Recognition that it is inappropriate to encourage trade or investment by weakening or reducing the protections afforded in domestic environmental laws.
- A Party may not undertake enforcement activities in the territory of another Party.

Proceedings, Remedies, Tribunals, and Voluntary Mechanisms

- Availability of fair, equitable, and transparent judicial, quasi-judicial, and administrative proceedings to sanction or remedy violations of environmental laws.
- Access for citizens to request investigation of alleged violations of environmental laws.
- Appropriate and effective access to remedies.
- Ensure impartial and independent tribunals.
- Encourage voluntary mechanisms to enhance environmental performance.
- Encourage flexible performance goals and indicators.

Opportunities for Public Participation

Public communications on matters related to the environment chapter of DR-CAFTA national consultative or advisory committee.

The Environmental Affairs Council

An Environmental Affairs Council comprising cabinet-level or equivalent representatives of the Parties will oversee the implementation of the environment chapter of DR-CAFTA, review its progress, and consider the status of cooperation activities developed under DR-CAFTA.

Environmental Cooperation

- Environmental Cooperation Agreement.
- Environmental Cooperation Commission.

- Priority areas of cooperation for environmental activities (Annex 17.9 of DR-CAFTA).

Submissions on Enforcement Matters, Factual Records, and Related Cooperation
Any person of a Party may file a submission asserting that a Party is failing to effectively enforce its environmental laws. This may lead to the preparation of a factual record and to recommendations from the Environmental Affairs Council to the Environmental Cooperation Commission.

Collaborative Environmental Consultations
A Party may request consultations with another Party regarding any matter arising under the environment chapter of DR-CAFTA. If the consulting Parties do not arrive at a mutually satisfactory resolution of the matter, the Council may be convened to consider the matter. If the matter concerns whether a Party is conforming to its enforcement obligations and the consulting Parties have failed to resolve the matter within 60 days of a request, the complaining Party may request consultations or a meeting of the Free Trade Commission and thereafter have recourse to the dispute settlement process set out in Chapter 20 of DR-CAFTA and the potential suspension of benefits or a monetary assessment.

Box AI-1: DR-CAFTA Dispute Settlement on Environmental Enforcement at a Glance

Cooperation. Parties shall make every attempt through cooperation and consultations to arrive at a mutually satisfactory resolution of any matter that might affect the operation of DR-CAFTA.
Consultations. Any Party may request in writing consultations with any other Party with respect to any actual or proposed measure or any other matter that it thinks might affect the operation of the Agreement. If the consulting Parties fail to resolve a matter through consultations, any such Party may request in writing a meeting of the Free Trade Commission.
Free Trade Commission. The Commission shall endeavor to resolve the dispute promptly. If the consulting Parties fail to resolve a matter, they may request the establishment of an arbitration panel to consider the matter.
Arbitration Panel. On receipt of the final report of a panel, the disputing Parties shall agree on the resolution of the dispute, which normally shall conform with the determinations and recommendations, if any, of the panel.
Monetary Assessment. If a panel determines that a Party has failed to effectively enforce its environmental laws through a sustained or recurring course of action or inaction, in a manner affecting trade between the Parties, and the disputing Parties are unable to reach agreement on a resolution or have agreed on a resolution and a complaining Party thinks that the Party complained against has failed to observe the agreement, the complaining Party may request that the panel impose an annual monetary assessment on the Party complained against.
The panel shall take into account factors that include the bilateral trade effects of the Party's failure to effectively enforce the relevant law, the reasons for the Party's failure to effectively enforce the relevant law, and the level of enforcement that could reasonably be expected of the Party given its resource constraints.
The amount of the assessment shall not exceed US$15 million annually, adjusted for inflation, as specified.
Assessments shall be paid into a fund for environmental initiatives, including efforts to improve or enhance environmental law enforcement in the territory of the Party complained against.
Suspension of Tariff Benefits. If the Party complained against fails to pay a monetary assessment, the complaining Party may take other steps, including suspending tariff benefits.

In principle, the potential consequences under DR-CAFTA of failure to effectively enforce environmental laws include the obligation to pay an annual monetary assessment and, failing payment, the suspension of tariff benefits. Although there is a lengthy process of consultation and there are opportunities to remedy a trade-affecting environmental enforcement failure before reaching this point (see summary of dispute settlement process in Box AI-1), there are serious practical consequences when a country fails to enforce its environmental laws, which include uncertainty for investors and the rise of informal disputes with trade competitors, aside from the environmental degradation that may be caused.

Annex II. Defining Dirty Industries

A conventional approach in the literature to define dirty industries has been to identify pollution-intensive sectors as those that have incurred high levels of abatement expenditure per unit of output in the United States and other Organisation for Economic Co-operation and Development (OECD) economies (Mani 1996; Robison 1988; Tobey 1990). By this criterion, five sectors emerge as leading candidates for dirty industry status; iron and steel, nonferrous metals, industrial chemicals, pulp and paper, and nonmetallic mineral products.[67]

Another, more direct, approach is to select sectors that rank high on actual emissions intensity (emissions per unit of output). Mani and Wheeler (1998) have determined the high-ranking sectors by this criterion using detailed emissions intensities by medium U.S. manufacturing at the three-digit Standard Industrial Classification (SIC) level. They then computed average sectoral rankings for conventional air pollutants, water pollutants, and toxics (heavy metals) as shown in Table AII-1. Again, five of the six sectors with highest overall ranks are iron and steel, nonferrous metals, industrial chemicals, pulp and paper, and nonmetallic mineral products.[68] The strength of this approach lies in the fact that the set of dirtiest manufacturing industries using this approach appears to be fairly stable across countries and pollutants.

Table AII-1: Average Sectoral Rankings for Conventional Air Pollutants, Water Pollutants, and Toxics/Metal

Rank	Air	Water	Toxic/Metal	Overall
1	Iron and steel	Iron and steel	Nonferrous metals	Iron and steel
2	Nonferrous metals	Nonferrous metals	Iron and steel	Nonferrous metals
3	Nonferrous minerals	Pulp and paper	Industrial chemicals	Industrial chemicals
4	Petro coal products	Miscellaneous minerals	Leather products	Petroleum refineries
5	Pulp and paper	Industrial chemicals	Pottery	Nonferrous minerals
6	Petroleum refineries	Other chemicals	Metal products	Pulp and paper
7	Industrial chemicals	Beverages	Rubber products	Other chemicals
8	Other chemicals	Food products	Electrical products	Rubber products
9	Wood products	Rubber products	Machinery	Leather products
10	Glass products	Petroleum products	Non-metallic minerals	Metal products

Source: Mani and Wheeler (1998).

[67] Petroleum is usually excluded because very few countries are actually involved in its production.

[68] While textiles do not figure here in the list, garment industries, with their backward linkage sectors like composite textile mills (including dyeing, printing, and finishing units), and leather-processing units, use substantial quantities of highly toxic dyes and chemicals. Some of these industries situated close to rivers dispose of their toxic wastes there. Tanneries and some other textile finishing units, situated in land-locked areas, also pose increasing pollution problems to the surroundings.

Annex III. Development Policy Loan (DPL) Triggers and Country Environmental Analysis (CEA) Recommendations

DPL III Triggers		CEA Recommendations
Reigniting Growth	Prepare Concessions agreement for Acajutla Port and present to Assembly	The improvement of the legal framework will make EIA permitting procedures more effective, efficient, transparent, and predictable. Compliance promotion and enhanced enforcement will improve environmental quality. Effective monitoring and enforcement of industrial pollution and investment in the expanding manufacturing and maquila sector. Develop corporate guidelines that recognize cleaner production as among the key corporate priorities and as a determinant of sustainable development. Develop both process-related and practical approaches to meeting global standards for exports in terms of technology and certification standards.
	Finalize study for the Cargo Airport Terminal of Comalapa	
	Progress in the investment climate agenda as illustrated by, for example: a. Competition and Consumer Protection Agencies in operation	
	Progress in the trade and FDI facilitation agenda, as illustrated by, for example: a. Facilitating an average of at least 2 new foreign investment projects per month by PROESA (El Salvador's foreign investment agency)	
	b. Presentation to Assembly of package of legal amendments required to ensure consistency with DR-CAFTA provisions	
Macroeconomic Stability and Fiscal Consolidation	2005 non-financial public sector deficit at or below 3% of GDP, and budget formulation policy for 2007 consistent with a NFPS deficit of 2.2%	Introduction of market-based instruments such as taxes and charges for regulating

	of GDP	air and water pollution and waste as a part of overall fiscal reform effort.
	Financial Supervision Law has been presented to Assembly consistent with Financial Sector Assessment Program recommendations related to consolidated supervision and strengthening of supervisory power	
	Banks have begun implementing the credit-rating methodology prescribed by the new provisioning rule	
Public Sector Management	At least 20 public institutions use the Dissemination Module (MODDIV) of the E-procurement system or public management to provide relevant information on purchases and contracts	Synergies with ongoing broader reform efforts to improve governance, transparency, and accountability should be expanded to improve environmental administration.
	Further progress in the PFM modernization agenda as evidenced by the expansion of the operation of the integrated financial management system (SAFI) to six additional entities, including the social security administration.	

Annex IV. Key Stakeholders

A description of key nongovernmental stakeholders and the regional organization CCAD is presented below.

The *Fundación Salvadoreña para el Desarrollo Económico y Social* (Salvadoran Foundation for Social and Economic Development, FUSADES) is an influential, independent, nonprofit think tank created in 1983 by Salvadoran businesspeople as a study and research center and as a facilitator of social and economic development. This organization played an important role in the adoption of the National Environment Law. In the past few years, it has been running a series of projects dealing with economic and legal aspects of the environmental agenda. FUSADES also offers laboratory services for environmental analyses.

The *Programa Salvadoreño de Investigación sobre Desarrollo y Medio Ambiente* (PRISMA), another think tank and research center, focuses on developing and integrating a socioeconomic approach to environmental problems and solutions. PRISMA has been a pioneer in the analysis of water issues in El Salvador, but it has also focused on biodiversity conservation, pesticide management, and deforestation.

The *Fundación Nacional para el Desarrollo* (National Foundation for Development, FUNDE) is an independent, nonprofit research center established in 1992 to generate alternative proposals for social and economic development. Its environmental focus is on trade and the environment, biodiversity, and intellectual property.

SALVANATURA is a "hands-on" environmental action group the main concerns of which are natural protected areas and environmental policy. Its major achievements are running awareness-raising campaigns, raising funds to purchase lands and expand protected areas in the country, environmental education, and management of natural areas for recreational purposes.

The *Centro Salvadoreño de Tecnología Apropiada* (Salvadoran Center for Appropriate Technology, CESTA) was the first environmental NGO to be founded in El Salvador, in 1980. It initially focused on research and development of agricultural technology adapted to the socioeconomic and environmental realities of El Salvador, but it now works on a wider range of environmental issues. In 1997, CESTA was awarded the UN "Global 500 Roll of Honor" prize for its environmental protection work in El Salvador.

The *Asociación Nacional de la Empresa Privada* (National Association of Private Enterprises, ANEP) is the main organization representing Salvadoran businesses. In the past decade, the environmental chapter of ANEP has actively promoted business awareness of environmental issues. ANEP has regularly participated in consultations with MARN and other entities on environmental issues and has provided information to the business sector on environmental requirements, technologies, and other environmental matters.

Among the many academic institutions in El Salvador, Don Bosco University and the University of El Salvador are the most involved in environmental issues.

Comisión Centroamericana de Ambiente y Desarrollo (Central American Commission on Environment and Development, CCAD). As a part of the *Sistema de Integración Centroamericana* (Central American Integration System, SICA) and by the decision of the Presidents of Central America, CCAD was created in 1989 with the main purpose to strengthen regional cooperation among national bodies responsible for managing natural resources and the environment. CCAD is formed by the Council of Ministers of Environment, a Secretariat and Technical Committees. CCAD works in partnership with national and regional entities responsible and with international organizations. CCAD has its regional headquarters in San Salvador and its two current key operational areas are:
(a) to develop the vision and strategies for planning sustainable development of the region, and
(b) to manage selective projects with a Central American perspective involving:

- Protecting the region's natural heritage;
- Establishing cooperation structures among Central American countries on environmental issues;
- Promoting coordinated actions between governmental and international institutions;
- Making the necessary efforts to obtain financial assistance from regional and international institutions in order to develop the aforementioned objectives;
- Strengthening national institutions in charge of the environment and natural resources;
- Including environmental and sustainable development parameters and considerations in national and regional planning processes;
- Determining priority areas for environmental action, such as education and environmental capacity building, water management and shared ecosystems, and the management of waste and hazardous substances that threaten the quality of life and health of the population, and
- Promoting the development of an environmental management strategy that encourages public participation, that is decentralized in character, and that is democratic in its operations.

In an effort to strengthen environmental management in the region, the CCAD launched the Central American Agenda on Environment and Development. This action plan was presented at the plenary session of the 1992 Rio Conference. It became the region's guiding document for implementing the commitments agreed to by Central America at Rio. It focuses on health, the environment, urban planning, and institutional capacity building. CCAD has also supported successful regional strategies such as the Alliance for Sustainable Development (ALIDES), adopted in 1994, which promotes an integrated sustainable development model including political, economic, social and environmental dimensions. This has allowed the existence of environmental authorities in each country as well as environmental commissions at the national legislative assemblies in each country and at the Central American Parliament (PARLACEN). El Salvador is taking

part in various CCAD's ongoing projects such as the GEF/UNDP-UNEP/GTZ funded Project to Consolidate the Mesoamerican Biological Corridor (MBC), Improved Environmental Management of the MBC (USAID), Conservation of Coastal Resources in the Fonseca Gulf (DANIDA), Forest and Climate Change in Central America (Holland), Program for Environmental Legislation (COSUDE), Program to Modernize Environmental Management in Central America (GTZ), Trade and Environment (UNDP), etc. Given its strategic location in El Salvador, its regional and national presence, and its sustainable development work program for Central America, CCAD is a key partner to disseminate the findings of this country environmental analysis and to implement its recommendations.

References

Antweiler, Werner. 1996. “The Pollution Terms of Trade.” Economic Systems Research 8(4):361–365.

Bureau of Oceans and International Environmental and Scientific Affairs. 2005. “Agreement Among the Governments of Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and the United States of America on Environmental Cooperation.” Washington, D.C.

CCAD, SICA, and PNUMA. 2005. “Geo Centroamérica Perspectivas del Medio Ambiente 2004”. Mexico.

CONACYT, El Salvador. 2005. “Catálogo de normas salvadoreñas obligatorias y recomendadas 2005.” San Salvador.

Copeland, Brian R., and M. Scott Taylor. 2003. International Trade and Environment: Theory and Practice. Princeton: Princeton University Press.

Cuellar, N., H. Rosa, S. de Larios, R. Duarte, and O. Díaz. 2001. “La gestión del agua en El Salvador: Desafíos y respuestas institucionales.” PRISMA: El Salvador.

Dean, Judith M. 2002. “Testing the Impact of Trade Liberalization on the Environment: Theory and Evidence.” Canadian Journal of Economics 35(4):819–42.

Environment Canada. 2001. “Compliance and Enforcement Policy for the Canadian Environmental Protection Act, 1999.” (Cepa 1999.) Ottawa.

_____2003. “El Salvador and Its Environmental Management System. A Descriptive Synopsis.” Ottawa.

FIAS. 2004. “Simplifying Business Establishment Procedures: A Review of Programs and Strategies in Bolivia and El Salvador.” Washington, D.C.

Gallagher, Kevin P. 2005. “The False Promises of CAFTA.” www.bilaterals.org.

Grossman, Gene M., and Alan B. Krueger. 1993. “Environmental Impacts of a North American Free Trade Agreement.” In Peter M. Garber, ed., The US-Mexico Free Trade Agreement. Cambridge, MA: MIT Press.

_____1995. “Economic Growth and the Environment.” Quarterly Journal of Economics 110(2):353–77.

Hecht, Susanna B., S. Kandel, I. Gomez, N. Cuellar, and H. Rosa. 2005. “Globalization, Forest Resurgence, and Environmental Politics in El Salvador.” World Development 34(2), February.

Hettige, Hemamala, Muthukumara Mani, and David Wheeler. 2000. “Industrial Pollution in Economic Development: Kuznets Revisited.” Journal of Development Economics 62(2):445–76.

Hettige, Hemamala, Paul Martin, Manjula Singh, and David Wheeler. 1994. “The Industrial Pollution Projection System.” Policy Research Working Paper #1431. Washington, D.C.: World Bank.

IADB. 2004. “CAFTA and the Rural Economies of Central America: A Conceptual Framework for Policy and Program Recommendations. Washington, D.C.: December.

_____2005. “El Salvador. Análisis De Competitividad Y Medio Ambiente (ACMA): Prioridades Para La Gestión Ambiental.” Serie de Estudios Economicos y Sectoriales. Washington, D.C., diciembre.

INCAE-BID. 2005. “El Salvador, Análisis de Competitividad y Medio Ambiente (ACMA): Prioridades para la Gestión Ambiental. Versión Ejecutiva.”

Larsen, B. 2003. “Hygiene and Health in Developing Countries: Defining Priorities through Cost-Benefit Assessments.” International Journal of Environmental Health Research 13:S37–S46.

Lovei, Magda, and Poonam Pillai. 2003. “Assessing Environmental Policy, Regulatory and Institutional Capacity.” World Bank Environment Strategy Note 7. Washington, D.C.

Low, Patrick, and Alexander Yates. 1992. “Do Dirty Industries Migrate?” In Patrick Low, ed., International Trade and the Environment. Washington, D.C.: World Bank.

Mani, Muthukumara S. 1996. “Environmental Tariffs on Polluting Imports: An Empirical Study.” Environmental and Resource Economics 7:391–411.

Mani, Muthukumara, and David Wheeler. 1998. “In Search of Pollution Haven? Dirty Industry in the World Economy, 1960 to 1995.” Journal of Environment and Development 7(3):215–47, September.

_____1998. “In Search of Pollution Havens? Dirty Industry in the World Economy, 1960–1995.” World Bank Discussion Papers, Chapter 8. Washington, D.C., April.

MARN. 2003. “Medio Ambiente en Cifras, El Salvador 2003.” http://www.marn.gob.sv/varios/cifras_MA.htm.

MARN, and PNUMA. 2004. “Informe Nacional del Estado del Medio Ambiente. GEO 2002.” San Salvador.

_____2005a. Ley del Medio Ambiente y sus Reglamentos. Leyes anexas. San Salvador.

_____2005b. “Memoria de labores: junio de 2004–mayo de 2005.” San Salvador.

_____2005c. “Plan operativo institucional 2005.” San Salvador.

_____2005d. “Seguimiento al Sistema de Evaluación Ambiental, Desarrollo informático.” Presentación 22 de octubre de 2005. San Salvador.

_____2005e. “UFI, Asignaciones presupuestarias consolidadas de 1997 al 2005, al 28 de septiembre de 2005.” San Salvador.

_____2005f. “UFI, Comparativo de presupuestos 2005 vs 2006 (A).” San Salvador.

_____2005g. “UFI, Modificación presupuesto 2005 vs anteproyecto 2006 (B).” San Salvador.

_____. 2002b. “Estrategia para el corto, mediano y largo plazos encaminada a contribuir a la Reforma del Estado en materia de gestión del agua, de los recursos naturales y el ambiente en El Salvador.” Documento Base. San Salvador.

Ministerio de Medio Ambiente y Recursos Naturales–El Salvador. 2002a. “GEO El Salvador: Informe Nacional del Estado del Medio Ambiente de El Salvador.”

OECD. 1995. “Recommendation of the OECD Council on Improving the Quality of Government Regulation, incorporating the OECD Reference Checklist for Regulatory Decision-Making.” Paris.

_____1997a. “Regulatory Quality and Public Sector Reform.” In The OECD Report on Regulatory Reform, Volume 2, Chapter 2.

_____1997b. “Report on Regulatory Reform.” Paris.

_____2002. “Regulatory Policies in OECD Countries. From Interventionism to Regulatory Governance.” Paris.

_____2003. “Guiding Principles for Reform of Environmental Enforcement Authorities in Transition Economies of Eastern Europe, Caucasus and Central Asia.” Paris

Pan-American Health Organization. 2002. La Salud en las Américas. Edición de 2002, Volumen II. Washington, D.C.

Panayotou, T. 1998. “El Salvador Challenge: From Peace to Sustainable Development.” http://www.fas.harvard.edu/~drclas/publications/revista/environment/panayotou.htm.

_____2000. “Environment for Growth in Central America: Environmental Management for Sustainability and Competitiveness.” John F. Kennedy School of Government, Harvard University. Cambridge, MA.

Paquin, M., and C. Sbert. 2004. “Towards Effective Environmental Compliance and Enforcement in Latin America and the Caribbean.” UNISFERA.

REDI (Recent Economic Developments in Infrastructure). 2005. “El Salvador Recent Economic Developments in Infrastructure.” Project: P090380.

Robison, D. H. 1998. “Industrial Pollution Abatement: The Impact on Balance of Trade.” Canadian Journal of Economics 21:702–6.

Rosa, Hermán. 2004. “Economic Integration and the Environment in El Salvador.” Discussion Paper Number 7, Working Group on Development and Environment in the Americas, June.

Sbert, C. 2004. “Elementos para una Gestión Ambiental Efectiva en El Salvador, Honduras, Nicaragua, Guatemala y Costa Rica: Informe Preliminar para Discusión.” UNISFERA Internacional Centre.

Scarborough, C., and N. Gong. 2002. Creating a Statewide Spatially and Temporally Allocated Agricultural Burning Emissions Inventory Using Consistent Emission Factors. Prepared for the Air Resources Board, California EPA.

Selden, Thomas M., and Daqing Song. 1994. “Environmental Quality and Development: Is there a Kuznets Curve for Air Pollution Emissions?” Journal of Environmental Economics and Management 29(2):162–68.

Shafik, Nemat. 1994. “Economic Development and Environmental Quality: An Econometric Analysis.” Oxford Economic Papers 46(0):757–73.

Sistema de la Integración Centroamericana SICA. 1999. “Plan de Acción para el Manejo Integrado del Agua en el Istmo Centroamericano.”

Smith, K. 2005. “Indoor Air Pollution. Environment Matters.” Washington D.C.: World Bank.

Strukova. 2005. The Cost of Environmental Degradation in El Salvador (paper commissioned for this report).

Therivel, R. 2003. “Strategic Environmental Assessment in Action.”

Tewari, Meenu, and Poonam Pillai. 2004. “Global Standards and the Dynamics of Environmental Compliance in India’s Leather Industry.” Forthcoming, 2005, Oxford Development Studies.

Tobey, James A. 1990. “The Effects of Domestic Environmental Policies on Patterns of World Trade: An Empirical Test.” Kyklos 43(2):191–209.

United States Trade Representative. 2005. “Central American-Dominican Republic–United States Free Trade Agreement.” http://www.ustr.gov.

USDA (United States Department of Agriculture) and George Bush School of Government and Public Service. 2004. “CAFTA: Sanitary and Phytosanitary Evaluation.”

Vidales, Roberto. 1992. “Indice de la Legislación Salvadoreña Vigente.” Centro de Estudios para la Aplicación del Derecho. San Salvador, El Salvador, Abril.

World Bank. 1999. “Trade, Global Policy and Environment.” World Bank Discussion Paper No. 402. Washington, D.C.

_____2000. “Greening Industry: New Roles for Communities, Markets and Governments.” Washington, D.C.

_____2004. “Recent Economic Developments in Infrastructure (REDI): El Salvador.” Washington, D.C.

_____2005a. “DR-CAFTA: Challenges and Opportunities for Central America.” Central America Department, and Office of the Chief Economist, Latin America and the Caribbean Region, Washington, D.C.

_____.2005b. DR-CAFTA: “Challenges and Opportunities for Central America.” Report No. 32288-LAC. Washington, D.C.

_____2005c. The Little Green Data Book 2005. Washington, D.C.

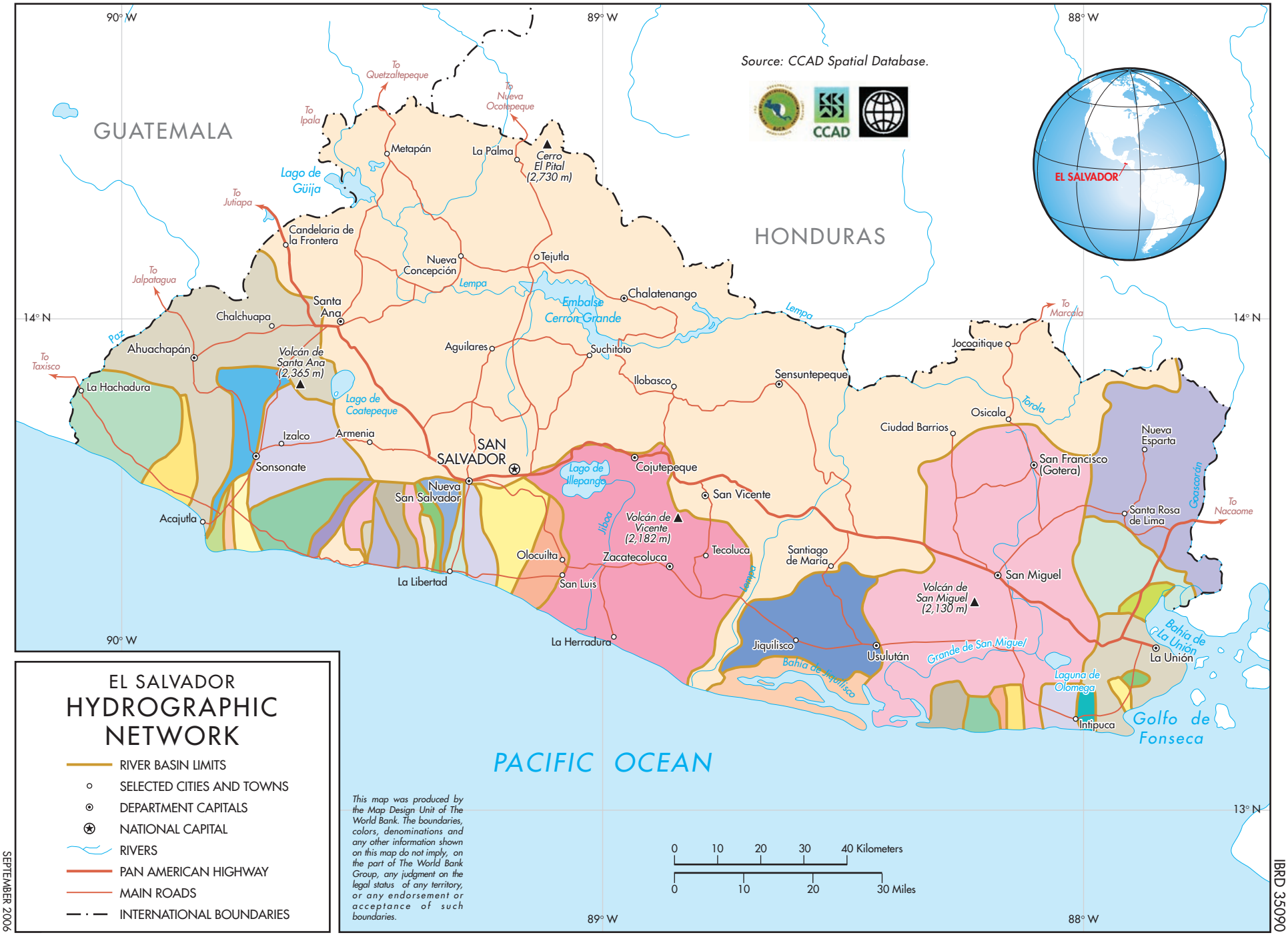
_____2005d. “Recent Economic Developments in Infrastructure Report: Concept Note.” Washington, D.C.

_____2005e. “Country Assistance Strategy for The Republic of El Salvador.” Washington, D.C.

_____2005f. “Integration Environmental Considerations in Policy Formulation: Lessons from Policy-based SEA Experience.” Washington, D.C., June.

_____2005g. “Chapter 3: Assessment of Colombia’s National Environmental System (SINA).” Country Environmental Assessment of Colombia. Washington, D.C.

WTO (World Trade Organization). 2004. “Trade and Environment at the WTO: Background Document. Geneva.



EL SALVADOR

HYDROGRAPHIC NETWORK

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

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SEPTEMBER 2006

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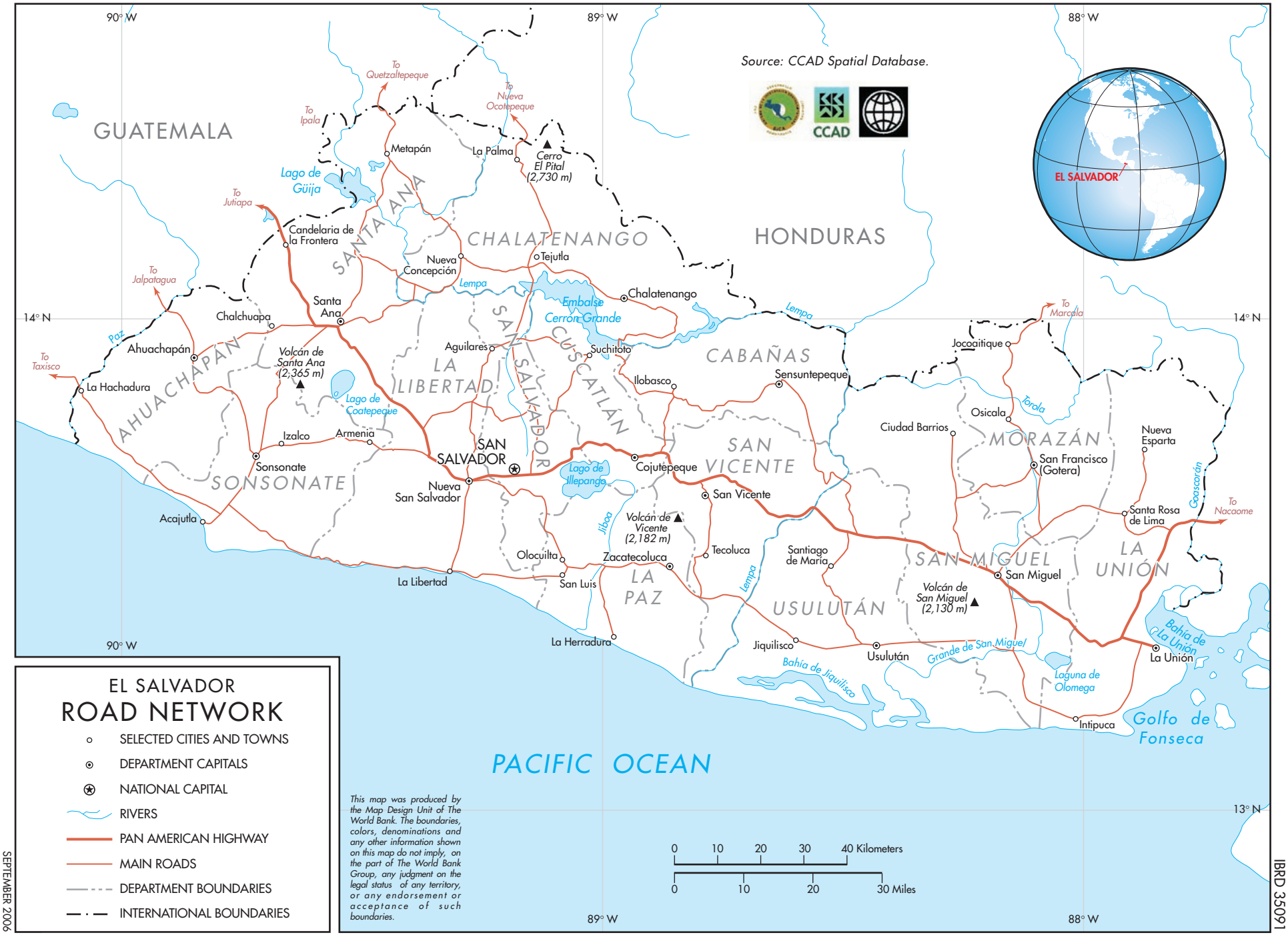
EL SALVADOR
ROAD NETWORK
SELECTED CITIES AND TOWNS
DEPARTMENT CAPITALS
NATIONAL CAPITAL
RIVERS
PAN AMERICAN HIGHWAY
MAIN ROADS
DEPARTMENT BOUNDARIES
INTERNATIONAL BOUNDARIES
Source: CCAD Spatial Database.
CCAD
EL SALVADOR
GUATEMALA
HONDURAS
PACIFIC OCEAN
Golfo de Fonseca
90° W
89° W
88° W
14° N
13° N
To Quetzaltepeque
To Nueva Ocotepeque
To Ipala
To Jutiapa
To Jalpatagua
To Taxisco
To Marcala
To Nacaome
Metapán
La Palma
Cerro El Pital (2,730 m)
Lago de Güija
Candelaria de la Frontera
Chalchuapa
Santa Ana
Nueva Concepción
Tejutla
Chalatenango
Embalse Cerrón Grande
Lempa
Paz
Ahuachapán
La Hachadura
Volcán de Santa Ana (2,365 m)
Lago de Coatepeque
Izalco
Armenia
Sonsonate
Acajutla
La Libertad
Aguilares
Suchitoto
Ilobasco
Sensuntepeque
Jocoaitique
Osicala
Ciudad Barrios
San Francisco (Gotera)
Nueva Esparta
Torola
Santa Rosa de Lima
Goascorán
SAN SALVADOR
Nueva San Salvador
Lago de Ilopango
Cojutepeque
San Vicente
Volcán de Vicente (2,182 m)
Jiboa
Olocuilta
Zacatecoluca
San Luis
Tecoluca
Santiago de María
San Miguel
Volcán de San Miguel (2,130 m)
Usulután
Jiquilisco
La Herradura
Bahía de Jiquilisco
Grande de San Miguel
Laguna de Olomega
La Unión
Bahía de La Unión
Intipuca
SANTA ANA
CHALATENANGO
AHUACHAPÁN
LA LIBERTAD
SAN SALVADOR
CUSCATLÁN
CABAÑAS
SONSONATE
LA PAZ
SAN VICENTE
MORAZÁN
SAN MIGUEL
USULUTÁN
LA UNIÓN
0 10 20 30 40 Kilometers
0 10 20 30 Miles
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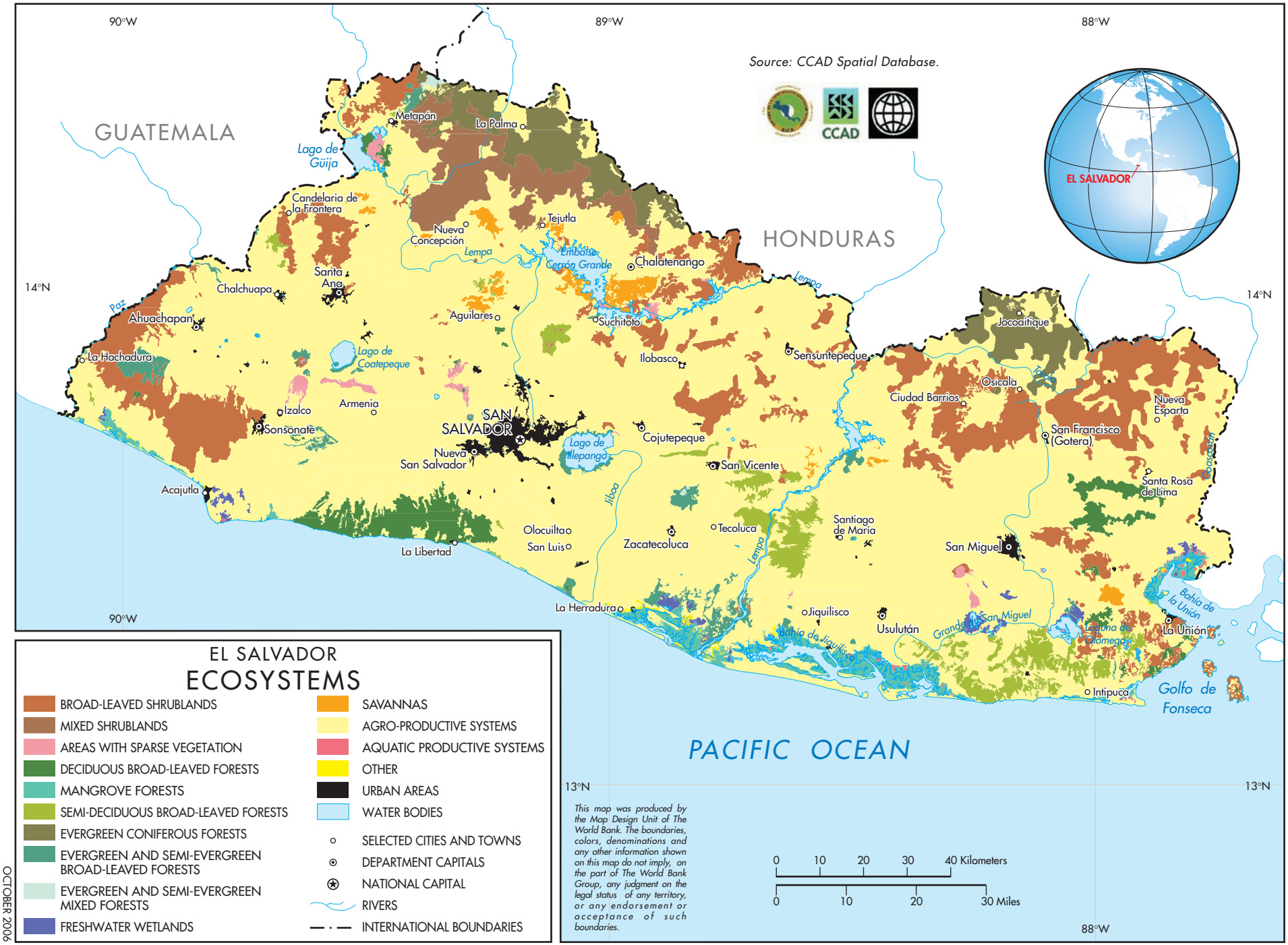

EL SALVADOR

ECOSYSTEMS

- BROAD-LEAVED SHRUBLANDS
- MIXED SHRUBLANDS
- AREAS WITH SPARSE VEGETATION
- DECIDUOUS BROAD-LEAVED FORESTS
- MANGROVE FORESTS
- SEMI-DECIDUOUS BROAD-LEAVED FORESTS
- EVERGREEN CONIFEROUS FORESTS
- EVERGREEN AND SEMI-EVERGREEN BROAD-LEAVED FORESTS
- EVERGREEN AND SEMI-EVERGREEN MIXED FORESTS
- FRESHWATER WETLANDS
- SAVANNAS
- AGRO-PRODUCTIVE SYSTEMS
- AQUATIC PRODUCTIVE SYSTEMS
- OTHER
- URBAN AREAS
- WATER BODIES
- SELECTED CITIES AND TOWNS
- DEPARTMENT CAPITALS
- NATIONAL CAPITAL
- RIVERS
- INTERNATIONAL BOUNDARIES

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EL SALVADOR
PROTECTED AREAS

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

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