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AGRICULTURAL POLICY ANALYSIS PROJECT, PHASE II

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GUATEMALA NATURAL RESOURCE POLICY INVENTORY USAID/ROCAP RENARM PROJECT

VOLUME I

EXECUTIVE SUMMARY

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PREFACE

Purpose of the Report

Natural resource management for sustainable development is particularly needed in the region of Central America, where severe problems of environmental degradation are inextricably connected to economic crises and political instability. In recent years numerous studies, reports, and articles have documented and drawn attention to predicaments of resource deterioration in Central America -- from deforestation and soil erosion to agrochemical pollution -- and to the debilitating socio-economic problems they have generated. The international community has recognized the urgent need to change the prevailing patterns of resource exploitation and to pursue new directions of sustainable economic development and natural resource conservation in this region. Governments, non-government organizations and international donors have begun to develop policies and projects to resolve these seemingly intractable dilemmas.

The Regional Environmental and Natural Resource Management Project (RENARM) is a comprehensive new ten-year effort to address these problems. Its central goals are to help create "conditions for sustained use of natural resources in a manner that minimizes damage, protects biodiversity, and provides the means for equitable and sustainable economic growth," and to "assist public and private institutions to generate, transfer and apply the information and technologies essential for sustained use of natural resources." The development of natural resource policies is a crucial component of RENARM, which will complement and shape the other components (i.e. education, wildlife conservation, sustainable agriculture and forestry, and institution building). The policy component is based on the following premise:

> "Attention to the political and legal framework which governs economic policies, regulations, enforcement, land use, economic incentives and environmental protection is a required element for successful strategies. Project interventions and long-range planning cannot proceed effectively without support and compatible policies and laws."[1]

The objectives of this component are to help create effective public policy and enforcement measures conducive to sustainable resource use, overcome policy constraints that jeopardize the environment and development, promote policy dialogue between governments and donors, and support constructive processes of policy-making for this purpose. The expected products include new legislation with effective enforcement measures, improved inter-agency cooperation, greater awareness of environmental policy issues, and incentives for improved management of land, watersheds, energy, fisheries, agrochemicals, forests, and wildlands.

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[1] Environmental and Natural Resource Strategy for Central America, USAID/ROCAP 1989.

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In order to fulfill RENARM's ambitious goals, it is first essential to understand the existing policy environment and the political, economic and social context that circumscribes and determines natural resource management and conservation in the region. Implementing improvements in this area is unfeasible without fully comprehending the past and present strategies or lack thereof and the socio-economic forces related to resource use activities, problems and policies.

A policy inventory providing essential background information for this purpose entails the following tasks:

a) identifying all policies and laws from both the public and private sectors at the regional, macroeconomic, and local levels which affect natural resources (including those pertaining to the economy, commerce, agriculture, forestry, energy, and industry);

b) identifying institutions and agencies (both government and non-government) that create and implement such policies;

c) conducting a qualitative assessment of the impacts of each policy on economic growth and the natural resource base in both the short and long run; and

d) analyzing the interactions of these policies, discussing significant gaps in the current policy set and determining principal policy alternatives for a research agenda.

Natural resource policy inventories will be conducted for Guatemala, Belize, Honduras, El Salvador, Costa Rica and for the Central American region as a whole. This report presents the results of the policy inventory for Guatemala.

Policy analysis is the second step within the policy component of the RENARM strategy. The inventories will contribute to the preparation of country-specific strategies for implementing RENARM. The policy analysis component of RENARM will analyze alternative environmental and natural resource policy options indicated in the inventories; adapt, improve and evaluate a range of methods for analyzing policy options; and characterize the political/institutional milieu in which policies are developed and implemented. The policy analysis component supports the policy dialogue and reform required to achieve RENARM's objectives.

Background Context of the Policy Inventories

Concern for the environment arises at a time when the energies of Central American countries are devoted to development goals that highlight expansion of production and alleviation of poverty. However, through the global economic crises, deepening debts, and declining terms of trade of the last two decades, the governments of Central America have faced increasing economic pressure to expand export production, repay burgeoning loans, and raise gross national product (GNP) in the short term. Governments have

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established policies and laws, including fiscal measures (such as taxation and subsidies), credit systems, colonization schemes, and customary land use legislation, which often maximize short-term profits and rapid growth. Large-scale monocultural enterprises, such as beef-cattle and cotton, and small-scale export crops have received particularly strong state support. These sectors have contributed greatly to the increase of exports, thereby generating badly needed foreign exchange.

The main objective of the policy inventory is to prioritize avenues of policy reform in which the goals of environmental conservation and economic growth are compatible. However, there are no "blueprint" policies and actions to resolve these complex dilemmas. The citizens and leaders of the individual countries need to adapt policy measures to their own situations.

At the same time, these countries urgently need to collaborate and learn from each other in the process of identifying successful measures. Some environmental and natural resource problems are regional predicaments that do not observe national boundaries. Inter-country exchange of information and formation of region-wide policies are essential initiatives that serve the interest of all Central American people.

The RENARM initiative of conducting policy inventories for natural resources in five Central American countries and one for the region as a whole was designed with these concepts in mind.

Contents of the Report

Volume I is a concise summary of the results and conclusions of the Guatemala Natural Resource Policy Inventory. It is non-technical and written for a wide audience. Illustrative examples are used to support the inventory's main conclusions.

Volume II is organized into chapters that progressively build support for the final chapter's recommendations for subsequent policy analysis of natural resource issues in Guatemala. In Chapter 1, the inventory clearly defines the terms policy and natural resource. Structure for the inventory is created by dividing policies into three major categories and identifying four major natural resource problems. This report connects natural resource issues to patterns of human behavior. Problems of water pollution, habitat destruction, and soil degradation cannot be isolated from factors that motivate people to misuse their natural resources.

Chapter 1 also introduces the inventory's main theme, that Guatemala's poverty and skewed resource distribution are indirectly the fundamental causes of the country's natural resource problems.

In Chapter 2, the report develops its main theme more rigorously. Political, social and economic factors that frame Guatemala's policy environment are discussed. The country's political instability is briefly traced and related to the public sector conditions required for sound resource management. The skewed distribution of political power across the population

is described. Centralized decision making and weak legal and institutional structures are presented as significant constraints to promoting rational natural resource management policies. Also, the degree and form of citizen participation in policy dialogue on natural resources is discussed and the implications from the lack of a national development strategy on natural resource management policies are presented.

Secondly, the distribution and mobility of land, capital and human resources is described. Poverty and its implications on formulating natural resource management policies is emphasized.

Finally, the significance of cultural and education factors in implementing natural resource management policies are discussed.

Chapter 3 is devoted to a description of the role of Guatemalan institutions that participate in natural resource policy-making. For each natural resource policy category identified in Chapter 1, the main formal institutions at international, regional, public and private levels, and their interactions are briefly described with the aid of charts. A discussion that highlights the degree of institutional complexity, coordination and cooperation with respect to a natural resource category proceeds each chart. Chapter 3 concludes with a discussion of how institutions coordinate activities tat cut across natural resource issues, such as integrated resource management and environmental impact assessments.

Chapter 4 summarizes the results of the policy inventory. First, the role of Central American regional policies and international agreements affecting Guatemala's natural resources is discussed. Secondly, Guatemala's macroeconomic policies, particularly recent reforms, are analyzed as they relate to the country's natural resource base. Finally, Policy Inventory Tables for sector and subsector policies are summarized. For each natural resource category, the main policies' effects on the economy and the natural resource in the short- and long-run are analyzed. The analysis of the social, cultural, institutional and political factors discussed in Chapter 2 and 3 are incorporated into the study. Cases where policies do not exist or are not implemented properly are also highlighted. Chapter 4 concludes with a brief discussion of interdependent natural resource policy issues.

Chapter 5 outlines a series of policy priorities that need further analysis, based on several factors:

a) the political, social and economic feasibility for policy reform;

b) the potential severity of the socio-economic and environmental impacts of policy reform; and

c) the ability of the policy reform to close the gap between objectives of economic growth and a long run sustainable natural resource base.

Conclusions drawn from the inventory are presented in Chapter 5.

Information useful for subsequent research in this area is provided in Appendices A - C at the end of Volume II. Over 80 people were interviewed for this study in Guatemala and the United States. Their names, addresses and phone numbers, when available, are presented in Appendix A. A list of over 250 documents obtained for this study and the sources of the information is provided in Appendix B. Finally, the names and brief background descriptions of the many contributors to this report are provided in Appendix C.

Volume III contains two technical appendices. Technical Appendix A presents the policy inventory tables that support the policy discussions of Chapter 4 and 5 of Volume II. Each table describes a policy and its objectives, cites the main institutions implementing or creating the policy, makes a qualitative assessment of its impact on economic growth and the natural resource base and briefly explains the assessment, and lists policy alternatives or issues requiring further research. Technical Appendix B briefly describes the characteristics and objectives of over ninety public, private, and international institutions and universities active in Guatemala's natural resource policy environment.

Summary

This inventory was conducted to gain a comprehensive understanding of the specific influences of all relevant policies, or lack thereof, and the political, institutional, social and economic factors which surround natural resource conditions. These policy influences are largely qualitative matters, often involving incommensurable factors of political power, social, and economic forces. Seldom can they be documented quantitatively. Yet this complexity does not discount their importance. Further research on policies will be needed over time to clarify the impacts and assess new responses and evolving conditions. The inventory of policies in this report is designed to fulfill the need for better information on existing strategies which will help stimulate the design of policies and actions for sustainable, equitable development and natural resource management in Guatemala and the entire Central American region.

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There were several people, in addition to the main authors, who significantly contributed to the content of this report. Appendix C of Volume II provides a brief description of their backgrounds. The Asociacion de Investigacion y Estudios Sociales Guatemala (ASIES), which provided technical and logistic support for the study, is gratefully acknowledged. The team would like to thank the many people and institutions who provided information, frank opinions, and helpful comments. In addition to the people interviewed during this study listed in Appendix A of Volume II, we would like to acknowledge Cesar Linares, Guillermo Toro and Lori Ann Thrupp and the support of the USAID/Guatemala mission and USAID/ROCAP. In particular, Al Nakatsuma, Ron Curtis, Ron Nicholson, Sam Skogstad, and Jack Vaughn made numerous valuable comments and suggestions. Comments made at the ROCAP seminar in Costa Rica by representatives from the Central American USAID missions were also quite helpful. Reviews by Charles Hanrahan, Cheryl Christensen and Rubin Nunez, and editing by Bill Levine and Paula Hirschoff at Abt Associates in Washington, D.C. are gratefully acknowledged.

ABSTRACT

USAID/ROCAP, under the Regional Environmental and Natural Resource Management Project (RENARM), funded country case studies of policies affecting the management of natural resources in Central America. Volume I of this report is a concise summary of the results and conclusions of the Guatemala Natural Resource Policy Inventory. It is non-technical and written for a wide audience. Illustrative examples are used to support the Inventory's main conclusions. Volume II presents the analysis of the study: it defines the terms policy and natural resource, it discusses the political, economic and social factors framing the natural resource management policy making and implementation processes in Guatemala, it analyzes the interactions among institutions involved in the policy process, and presents the major findings and policy recommendations of the study. Volume III provides a brief description of over ninety public, private, and international institutions and universities active in Guatemala's natural resource policy environment and presents policy inventory tables. Each table identifies a significant natural resource management policy and the institutions mandated to implement the policy, makes a qualitative assessments of the impact on economic growth and the natural resource base, and lists policy alternatives suggested for future analysis.

In addition to the analysis of regional and macroeconomic policies, over fifty sector policies were identified as having a significant impact on the management of Guatemala's natural resources. Problems of lack of laws, institutional overlap, and insufficient resources for enforcement of policies were identified and highlighted.

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LIST OF ACRONYMS

BANDESA	Agricultural Development Bank
CONAMA	National Environmental Commission
CONAP	National Council for Protected Areas
COPECAS	Permanent Coordinating Committee for Drinking Water Supply and Sewer Services
DIGEBOS	General Directorate of Forest and Wildlife
DIGESA	General Directorate of Agricultural Services
DIRYA	Technical Directorate of Irrigation and Drainage
FYDEP	National Company for the Economic Promotion and Development of the Peten
ICAITI	Central American Institute of Industrial Research and Technology
ICTA	Agricultural Science and Technology Institute
INDE	National Institute of Electrification
INGUAT	National Tourism Institute
INTA	National Agrarian Transformation Institute
MAGA	Ministry of Agriculture, Livestock and Food
RENARM	Regional Environmental and Natural Resource Management Project
ROCAP	Regional Office for Central American Programs
USAID	U.S. Agency for International Development

1.0 SUSTAINABLE AGRICULTURE

1.1 An Overview[2]

- Approximately 50% of the total labor force remains in agriculture, concentrated on a large number of small farms (88% of farms are on 14% of the land).

- Sixty percent of the rural population is classified as living in absolute poverty.

- If a score of 100 is established for the economy's labor productivity, the agricultural labor force operates at 45, which is very inefficient.

- In 1960, 14% of land was devoted to agriculture; by 1980, the proportion had climbed to 17%, but the population had almost doubled.

- Eighty percent of Guatemala's land mass is hilly, 35% of which has good soils, 15% marginal soils and 14% poor soils. An estimated one-third of Guatemala's land mass is seriously eroded or degraded.

- Not only are stocking rates for pastures low (1.9 cows per square hectare) but pasture quality is poor in terms of low nutritional levels of forage for cattle. Yields per cow average 913 kg compared to 5,386 kg in the U.S.

- Cattle/beef has the lowest land productivity of all major agriculture exports when measured by the ratio of export receipts to land area.

- Pesticides are overused in Guatemala, accounting for 50% of production costs for cotton production. Farmers use an average of 80 kg of insecticides per hectare annually, making between 30 and 40 applications (worldwide average is eight applications per year).

- Pesticide resistance is increasing and natural predators are being eliminated. Workers wear no protective clothing and cannot read warning labels. Families in rural areas bathe in irrigation channels contaminated by pesticides. Residues of Parathion and chlorinated hydrocarbons such as DDT are found in tissues of workers. Milk and meat samples in cotton-growing areas have 90 times the amount of pesticide residue permitted in the U.S. When

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[2] These overview sections, one for each natural resource issue, were compiled by Dr. William Levine of Abt Associates from Leonard (1987), Broonor and Rivas (1988) and Universidad Rafael Landivar (1984).

pesticide residues in meat register above export allowances, they are sold in Guatemala City.

1.2 Issues

Guatemala's problems in sustainable agriculture include the following:

- The externalities of "modern" agricultural practices, such as the environmental consequences of modern chemical inputs (e.g. fertilizer and pesticides),
- Population and land pressure in areas with highly erosive soils,
- Inappropriate and environmentally destructive cultivation of lands unsuited to permanent crop cultivation,
- Campesinos' resistance to changing traditional agricultural practices, and
- "Sustainable agriculture" technology has not been adapted to the specific conditions of Guatemala.

1.3 Policies

The Inventory identified 12 policies with significant direct effects on sustainable agricultural practices. The team considered those dealing with pesticides and colonization as the most significant. Pesticide laws and regulations are well written, but there are virtually no enforcement or educational programs to support them. Population pressures and skewed land distribution problems are key forces hindering the adoption of sustainable agricultural practices.

Policies that SUPPORT sustainable agriculture

A. Pesticide regulations on the importation, production, storage, transportation, sale and use of pesticides

WHAT WORKS

The regulations contain provisions to prevent the importation of pesticides that are banned in other countries. They also contain recommended application rates and practices. ICAITI has assembled a relatively comprehensive collection of information on pesticides and their permitted uses in various countries.

WHAT DOESN'T WORK

Banned pesticides are imported illegally. This issue must be addressed on a Central American regional level.

Recommended application practices are often ignored at the farm level, partly because farmers lack information and training and partly because enforcement of these standards is lax.

There are no standards for acceptable levels of pesticides in foods marketed in Guatemala.

There is little capacity to test for pesticide residues in Guatemala. Reportedly only one lab is capable of conducting such tests.

Jurisdictional differences between the Ministry of Agriculture and the Ministry of Health hamper coordinated implementation of pesticide and health related policies.

B. Protected Areas Law passed in September 1989

WHAT MIGHT WORK

The new law creates protected areas for special habitats and buffer zones surrounding them. Sustainable agricultural and agroforestry management practices would be features of the buffer zones.

WHAT MIGHT NOT WORK

Buffer zones will be hard to manage effectively, given population pressures and lack of widely available information on sustainable agriculture and agroforestry practices for such areas.

Maintaining both protected areas and buffer zones will require the support and involvement of local residents.

Policies that HINDER sustainable agriculture

A. Colonization policies

WHAT DOESN'T WORK

In response to population pressure in the highlands, the Peten, Izabal and Northern Transversal Strip are being colonized by small farmers whose traditional cultivation practices are inappropriate for these environments. Without formal title to land, these farmers have no incentive to make long-term investments in managing the natural resources. Slash and burn agriculture with short intervals for recuperation destroys the forest cover and rapidly exhausts soil fertility. The result is deforestation, habitat destruction and increased erosion.

Large cattle ranches are also inappropriate for the soils of the Peten and other humid tropical soil types.

B. Agrarian Transformation Law

WHAT DOESN'T WORK

The sale of unexploited land to small farmers leads to environmental degradation when the land is environmentally different from that on which they have lived. These farmers often lack the entrepreneurial skills necessary to adapt to these new conditions. Their use of inappropriate traditional cultivation practices destroys forest cover, rapidly exhausts soil fertility and increases erosion.

Exhausted land is sometimes sold to large holders for cattle ranching, thus defeating the economic objective of helping small farmers, while also imposing environmental costs.

1.4 Research Agenda

1.4.1 Pesticide Law

- Examine ways to incorporate farmers' attitudes regarding pest control methods into enforcement of the law.
- Study application procedures to improve compliance with this law and regulations.
- Study ways to strengthen institutions, including improvements in technical capacity.
- Study and develop alternative pest control methods, such as integrated pest management and organic pesticides.
- Study standards for acceptable levels of pesticides in foods marketed in Guatemala.

1.4.2 Protected Areas Law

- Examine ways of incorporating community attitudes, goals and activities into the implementation of the law.
- Study economic activities in protected areas to develop culturally and ecologically appropriate long-term use policies.
- Examine successful buffer zones in other countries to develop by-laws and buffer zone categories using a "sustainable management" approach.
- Develop management plans for critical protected areas and monitor their implementation.

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1.4.3 Peten Colonization Policies

- Study ways to strengthen institutions (DIGEBOS, CONAP, DIGESA, ICTA, INTA, BANDESA) administering resources in the Peten.

- Study alternative development options to agricultural production in accordance with the natural resources of the Peten: sustained forest management; agroforestry systems; sustained production of non-wood forest products. Conduct field experiments to validate these alternatives.

- Develop ways to promote agricultural production techniques that are sustainable for Peten's soils.

- Assess the political power structure in the Peten and identify constraints to policy implementation.

- Assess the policy implications of the current limited physical access to the Peten.

1.5 Actions to be Taken

- Develop workable buffer zone policies for prioritized protected areas with management plans that reflect the experience of other countries in such programs.

- Develop ways to build support for protected areas and buffer zones among the local population. Examine the experience of other countries in creating benefits for the local population from such areas (e.g. ecotourism).

- Improve institutional capacity in the Peten. Given that FYDEP is dissolved, INTA, DIGEBOS and CONAP have the additional burden of monitoring and regulating activities in the Peten.

- Disseminate information on appropriate pesticide uses and support institutional strengthening needed to enforce regulations.

2.0 PRODUCTION FROM NATURAL FORESTS

2.1 An Overview

- Guatemala cuts 90,000 hectares of forests but only reforests approximately 16,000 hectares (6.3 in broadleaf, 9.5 in coniferous) each year.
- Much of the forest cut for land clearing activities is never harvested due to lack of roads and high transportation costs.
- Guatemala is losing an average of 11% of its total forest cover per decade. In 1960, 77% of land was under forest cover; in 1970, 47%, and by 1980, only 42%.

2.2 Issues

Guatemala's problems in forestry include:

- Deforestation,
- Need for reforestation (public and private), and
- Forest management.

2.3 Policies

The Inventory identified 23 policies directly affecting natural forests, many of which are found in the Forestry Law of December 1989 and its proposed regulations. The Forestry Law provides a wide range of regulatory, fiscal, and trade policies to address forestry issues. The law is good on paper. Whether it will be effective depends primarily on how rapidly and how well it can be implemented. Slow implementation will permit or even accelerate ongoing deforestation. Poor implementation resulting from institutional weaknesses will destroy the potential effectiveness of the law.

Policies that SUPPORT sustainable production from natural forests

A. Fiscal incentives for forestation or reforestation in the Forestry Law (Articles 83-89)

WHAT WORKS

The legislation provides tangible tax incentives for approved forestry or reforestation projects. Individuals undertaking such projects receive a 50% income tax reduction and a 100% land tax exemption for four years.

Proposed regulations permit cutting 15 years after planting and stipulate length of concessions equivalent to two to three tree cycles.

WHAT DOESN'T WORK

The implementing agency (DIGEBOS) lacks the technical capacity and institutional incentives to professionally evaluate project proposals.

Penalties for violations are too low.

WHAT MIGHT NOT WORK

Revenue implications for the government are not clear.

B. Concession provisions of the Forestry Law (Articles 7-9,11,13,16)

WHAT WORKS

The legislation provides an incentive for more effective forestry management by tying the awarding of timber concessions to approved forestry management plans.

Proposed regulations require that DIGEBOS inspect and take an inventory of each area. The results along with the selection criteria must be published in a newspaper so that bids on the concession can be submitted to DIGEBOS. A commission composed of a lawyer, a CPA and a DIGEBOS representative will award the concession to the best bidder.

Communities living near the forested area may organize and bid on a concession.

Concessions for municipal lands are granted by local governments. Technical support from DIGEBOS will be made available.

WHAT DOESN'T WORK

DIGEBOS lacks technical and institutional capabilities to professionally evaluate and monitor forest management plans. DIGEBOS is under strong political pressure to approve plans.

Delayed implementation will permit continued, rapid deforestation currently associated with large-scale logging operations.

Penalties for violations are too low.

WHAT MAY NOT WORK

Ten years is an inappropriate concession period. Depending upon the type of trees involved, it may be too short to provide an economic incentive for private firms to invest in reforestation. There are separate concessions for cutting and reforestation.

There is no maximum or minimum area for a concession. Without a ceiling, the policy could further skew land and wealth distribution. Without a minimum, the policy could raise administrative costs per hectare.

C. Stumpage Tax in Forestry Law (Article 94)

WHAT WORKS

The new law provides revenue for the Forestry Fund from the extraction of timber.

WHAT MAY WORK

By assigning monetary value to the entire tree (and not just those parts currently used by the timber industry), the calculations used to establish the stumpage tax will increase the economic value of forests. With appropriate implementation and expertise, this could result in better long-term allocation of forest resources.

WHAT MAY NOT WORK

Collecting the tax will require DIGEBOS personnel to monitor timber cutting.

The tax might provide fiscal incentives for DIGEBOS to encourage extraction.

Penalties for violations are too low.

Policies that HINDER production from natural forests

A. Peten Colonization policies

WHAT DOESN'T WORK

In response to population pressure in the highlands, the Peten is being colonized by small farmers whose traditional cultivation practices are inappropriate to the Peten's environment. Without formal title to land, these farmers have no incentive to make long-term investments in managing the natural resources of the land. Slash and burn agriculture destroys the forest cover and rapidly exhausts soil fertility. The result is deforestation, habitat destruction and increased erosion.

Timber operations lead to deforestation, timber waste, habitat destruction and increased erosion. Sustainable agricultural practices cannot be established in the wake of deforestation.

B. Agrarian Transformation Law

WHAT DOESN'T WORK

The sale of unexploited land to small farmers leads to environmental degradation when that land is environmentally different from the areas where they have lived. Their use of inappropriate traditional cultivation practices destroy forest cover, rapidly exhaust soil fertility and increase erosion.

Exhausted land is sometimes sold to large holders (for cattle ranching), thus defeating the economic objective of helping small farmers while also imposing environmental costs.

2.4 Research Agenda

2.4.1 Forestry Law

- Study ways to determine and update "base forest values" for the stumpage tax.
- Examine fiscal importance of the Forest Fund for DIGEBOS and alternative forms of financing.
- Study means of reinvesting the stumpage tax revenue for long-run sustainability of the forests.
- Study ways to support and fund DIGEBOS, including developing training programs for the staff.
- Study the coordination among the institutions mandated to implement concession policy components of the law.
- Study the penalty system and recommend alternatives to maintain the values of the fines over time.
- Review the relationship between DIGEBOS and the judicial system and recommend better enforcement procedures.
- Improve the quantity and quality of DIGEBOS' field personnel for effective enforcement.

2.4.2 Peten Colonization Policies

- Study ways to strengthen institutions (DIGEBOS, CONAP, DIGESA, ICTA, INTA, BANDESA) that administer resources in the Peten.
- Study alternative development options to agricultural production in accordance with the natural resources of the Peten: sustained forest management; agroforestry systems; sustained production of non-wood forest products.

- Assess the political power structure in the Peten and identify constraints to policy implementation.

- Assess the policy implications of the Peten's limited physical access.

2.4.3 Agrarian Transformation Law

- Evaluate land tenure and use in the Peten to develop new polices for distributing lands.

- Develop monitoring system to ensure INTA's compliance with the law in the Peten.

2.4.4 Development of Secondary Wood Product Markets

- Study economic feasibility of tree crop production (wood, fruit and spices) to improve long-term natural resource use.

- Develop monitoring and dissemination system for external supply and demand trends for wood products in relevant international markets.

- Develop means necessary to provide technical assistance to raise product quality to international standards.

2.5 Actions to be Taken

In Guatemala the new Forestry Law has high priority for policy action. Significant resources have been invested in creating sound enabling legislation. The initial steps toward implementation now being taken are triggering resistance from key interest groups (such as the timber industry). Supporting implementation of this law should be the major policy action in the forestry area.

- Actively support implementation of the new Forestry Law.

- The regulations to support the new law have now been written. Interest group opposition to their existence is already evident. Monitor the status of enactment to ensure the regulations do not fall victim to internal bureaucratic delay.

- Strong regulations may produce strong lobbying by organized interests at high political levels. Make sure information on the benefits of the law are made available at this level, with a clear indication of the importance USAID attaches to them.

- Keep Guatemalan environmental groups informed and engage them in the creation of an effective Forestry Law.

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- Create the institutional capacity necessary to enforce the new law's regulations.

- Strengthen DIGEBOS' technical and institutional capacity to evaluate required new management plans and use them to make professional decisions. Strengthen its capacity to monitor compliance.

- Develop mechanisms for cooperation between DIGEBOS and INTA with respect to forestry and agricultural development policies.

3.0 WATERSHED MANAGEMENT

3.1 An Overview

- Guatemala uses less than 10% of its hydropower potential.
- Annual soil runoff is from 20-30 metric tons per hectare in areas still under vegetative cover and from 700-1,110 metric tons per hectare in unforested areas. This sedimentation not only undermines agriculture production, but threatens hydro power potential, increasing flooding and overwhelming irrigation efforts.
- Only 8% of Guatemala's original mangrove resources remain.

3.2 Issues

Guatemala's water resource issues are:

- Regulating water quality,
- Regulating water uses, and
- Managing of watersheds.

3.3 Policies

Twenty-two policies were identified as having significant direct effects on Guatemala's water resources. As in the case of sustainable agriculture, many laws and policies are well-written, but lack the institutional support needed to implement them.

3.3.1 Regulating Water Quality

Policies that SUPPORT regulation of water quality

A. Water Quality Policies as referenced in the Political Constitution (Articles 93-96, 98-99, 127), the Water Effluent Law (Decree No. 60-89), Environmental Law, Health Code (Articles 18-19, 43) Municipal Code and Regulations (Article 70) Regulation of Waste Waters (Decree 60-68), Mining Code and Hydrocarbon Law.

WHAT MIGHT WORK

The Effluent Waters Law sets the maximum permissible level of contamination for discharge of residual waters.

The regulations of the Health Code, the Municipal Code and regulations, the Mining Code and the Hydrocarbon Law have allowed CONAMA to take legal

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actions to control water quality, such as the requirement for an environmental impact assessment study for a petroleum well in the Peten.

WHAT DOESN'T WORK

There is no law stipulating water quality standards. Multiple and overlapping jurisdictions impede the development of a comprehensive set of water quality standards.

There are no Public Health Law regulations for waste disposal or potable water.

The inventory identified 15 agencies that issue regulations affecting drinking water and sewage disposal. Minimal coordination exists among the institutions that provide drinking water and sewer services through COPECAS.

There is no effective enforcement of the recently enacted Effluent Waters Law.

Legislation is fragmented. For example, the dumping of untreated residual waters violates five laws.

Lack of coordination among implementing agencies of the Effluent Waters Law (CONAMA, ICAITI, Ministry of Public Health, Universities) leads to fragmented and overlapping planning.

Institutional support and resources to implement and enforce water quality policies are lacking. For example, DIRYA does not have the personnel to issue water permits, CONAMA lacks the personnel and funding to enforce the Environmental Law, and the Ministry of Public Health lacks resources to improve the quality of drinking water. Resources are lacking for enforcement of the Effluent Waters Law.

Policies that HINDER regulation of water quality

A. Tax incentives for decentralization

WHAT DOESN'T WORK

Tax incentives to promote industrial activity outside Guatemala's metropolitan areas have a strong negative impact on water resources through increased water depletion and contamination.

B. Colonization policies referenced in the Political Constitution (Articles 67 and 68), the Agrarian Transformation Law (Articles 12 and 14) and the National Development Plan (1987-1991).

WHAT WORKS

Easing population pressures reduces demand for water resources in some areas.

Environmental Impact Assessment study was made for a petroleum well in the Peten.

WHAT DOESN'T WORK

Colonization of the Northern Transversal Strip, land grants in the Peten and other northern areas of the country, development of national farms and cooperatives, and the reorganization of small farmer plots, especially in the western highlands, have led to the destruction of large forested areas, changes in the availability and quality of water, and the loss of soil, valuable genetic resources and biological diversity.

C. Nontraditional crop policies (Pesticide Law, production and marketing promotion)

WHAT DOES WORK

The Pesticide Law mandates DIGESA to regulate the use of pesticides to reduce contamination of both soil and water resources.

WHAT DOESN'T WORK

Production of nontraditional crops is concentrated in areas situated in the highest part of the watershed. The overexploitation of the water sources and contamination of the soil and water caused by agrochemicals will negatively affect the users down river.

3.3.2 Regulating Water Uses

Policies that SUPPORT sustainable water use practices

A. Water Use Regulation, as referenced in the Political Constitution of Guatemala (Articles 127-128)

WHAT WORKS

The Constitution establishes the basis for issuing permits for water use.

WHAT DOESN'T WORK

DIRYA, the only government office authorized to control water use and issue permits, has limited regulatory capabilities and concentrates mainly on irrigation.

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Policies that HINDER sustainable water use practices

A. Irrigation Policies (Water Charges Government Agreement No. 11-80)

WHAT WORKS

The agreement requires that quotas be established to cover maintenance and operation costs and the payments for irrigation projects infrastructure. In 1988, 85% of the quotas were collected.

WHAT DOESN'T WORK

Almost 88% of the irrigated lands are under the control of private consortia that operate almost without governmental regulation.

B. Hydroelectric Development Policy, as referenced in the Political Constitution of Guatemala, Article 129

WHAT DOESN'T WORK

INDE has been the governmental institution with the strongest indirect impact on water resources. This influence has resulted from the large government investments made in recent decades on hydroelectric projects such as the following: Jurum Marinala, Los Esclavos, Aguacapa and more importantly, Chixoy. These projects have not included or considered a management plan for the affected watersheds and the repercussions of this omission have affected the natural resources.

WHAT MIGHT WORK

Steps have been taken to incorporate watershed concerns into management plans for hydroelectric projects in the Higher Watershed Zone of Chixoy and the Xaya and Pixcaya sub-watersheds.

3.3.3 Watershed Management

Policies that SUPPORT watershed management

A. Watershed management policies under the Environment Law, the Forestry Law and the Law of Protected Areas, all recently issued, are based on the Political Constitution of Guatemala.

WHAT WORKS

The Forestry Law and Protected Areas Law require the protection of critical watersheds and areas at high elevations because of their importance for recharge of the water supply.

Under Environment Law some legal actions and operations have been initiated that protect the environment and manage natural resources.

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The Environment Law has motivated natural resource development projects specifically relating to water resources to focus on watershed management (Chixoy, Atitlan, Xaya-Pixcaya and Amatitlan).

CONAMA has requested that all development projects comply with Article 8 of the law, which requires an environmental impact assessment.

WHAT MIGHT WORK

The National Commission for Watershed Management was created through the initiative of CONAMA and MAGA as a result of the Environment Law. Its purpose is to coordinate the institutions dealing with watershed management.

WHAT DOESN'T WORK

DIGEBOS has no policy for protecting forests in critical watersheds.

Multiple institutions affect watershed management. The Inventory identified over 30 institutions that conduct activities impacting watershed management.

B. Protecting riverbanks and shorelines (The Reserve Areas Law, The Protected Areas Law, Forestry Law)

WHAT WORKS

The Reserve Areas Law maintains government domain over waterfronts.

The Protected Areas Law includes the protection of 3 km of the ocean coastal zones, 100 meters on both sides of rivers, 200 meters around lakes and 50 meters around springs.

The Forestry Law mandates DIGEBOS to protect mangroves.

WHAT DOESN'T WORK

Policies to protect waterfronts are ineffective in managing water resources because homes have already been built on the riverbanks and seashores.

There are no effective management policies to regulate the use of mangroves.

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3.4 Research Agenda

3.4.1 Water Quality Policies

- Study and set water quality standards and regulations for waste disposal.
- Study ways to create a water law that will integrate all water quality policies.
- Study ways to strengthen institutions' abilities to enforce policies and coordinate activities.
- Study and develop guidelines and systems to enforce Article 8 of the Environmental Law, requiring environmental impact assessments for development plans and the Effluent Waters Law.
- Study and develop municipal zoning ordinances in areas potentially affected by decentralization policies.

3.4.2 Water Use Policies

- Develop guidelines to incorporate environmental impact assessments and watershed management into plans for hydroelectric plant, irrigation and water supply and sanitation projects.
- Study ways to strengthen DIRYA's regulatory capabilities to control water use and issue permits.

3.4.3 Water Management Policies

- Develop the "special protection of critical watersheds" system specified in the Forestry Law and identify the critical watersheds.
- Design effective sustainable management schemes for mangrove extraction.
- Study mangrove extraction incentive systems, taking account of cultural traditions and alternative forms of mangrove management.

3.5 Actions to be Taken

- Develop, issue, and enforce water quality standards
- Issue a comprehensive water use law
- Improve public health laws by issuing regulations on waste disposal
- Issue regulations for the Environment, Protected Areas and Forestry Laws

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- Issue new fisheries law and regulations
- Streamline institutional participation in water policies and improve interagency coordination.
- Support and implement watershed management plans in areas such as Xayi-Pixcuym, Atitlan, Amatitlan and Penstiro.

4.0 MANAGEMENT OF WILDLANDS

4.1 An Overview

- One-third of Guatemala's land is either protected or designated as reserved.
- The rain forested areas of the south have been completely lost.
- There are fewer than 30 manatees left.
- In a period of four years, two-thirds of the Atitlan Divers (birds) were lost.

4.2 Issues

Guatemala's problems in wildland management include:

- Protection of endangered species and
- Preservation of ecosystems.

4.3 Policies

Guatemala's complex topology has created a special ecological heritage. The country is a repository of diverse ecosystems populated with rare, often endangered, wildlife species. Although the Inventory identified 17 policies as having significant direct effects on the management of wildlands in Guatemala, two laws contain the most important policies: the Protected Areas Law and the General Hunting Law. The recently passed Protected Areas Law contains a range of regulatory, fiscal and trade policies designed to preserve wildlife, biodiversity and ecosystems. While this law, like the new Forestry Law, looks good on paper, its impact will depend on whether it can be effectively implemented. Successful implementation requires both the institutional capacity to monitor compliance and the development of local support for the law's provisions.

Policies that SUPPORT Wildland Management

A. Protected Areas Law

WHAT MIGHT WORK

The new law creates protected areas for special habitats and buffer zones surrounding them. Sustainable agricultural practices would be a feature of the buffer zones.

By-laws and licenses for economic activity within protected areas need to be developed to effectively implement the new law.

WHAT MIGHT NOT WORK

Thirty-three percent of Guatemala's land is declared protected or reserved. This is too large an area to be feasibly managed because the population pressures are great and the institutional capacity to manage land is limited.

Managing buffer zones effectively will be difficult, given population pressures and the vagueness of the law on the development of sustainable agriculture and forestry management in buffer zones.

Maintaining both protected areas and buffer zones will require the support and involvement of local residents.

B. Fiscal incentives in the Protected Areas Law

WHAT MIGHT WORK

The law provides tax incentives for converting private property into natural reserves by providing exemptions from territorial and income taxes. It provides similar incentives for individual activities for researching, promoting or developing protected areas.

C. Regulation of Endangered Animal Species, Protected Areas Law, with supporting provisions in the General Hunting Law

WHAT WORKS

The law prohibits gathering, capturing, hunting, fishing, transporting, exchanging, selling and exporting endangered wildlife species.

WHAT MIGHT WORK

Exports are permitted under special conditions (e.g. the export of second generation animals produced in controlled conditions by authorized individuals or legal entities meeting the law's requirements).

WHAT DOESN'T WORK

There is no comprehensive definition of endangered species.

There is no policy to update list of endangered species.

The institutional capacity to monitor compliance with the law is weak.

There are no policies to promote conservation of habitat and ecosystem for an endangered specie.

D. Regulation of Endangered Flora and Fauna Species, Protected Areas Law, with supporting provisions in the Forestry Law

WHAT MIGHT WORK

The laws stop and/or control the extraction of and commerce in endangered tree species, as well as other endangered plants.

WHAT MIGHT NOT WORK

No incentive is provided for commercial cultivation of protected species.

Policies that HINDER wildland management

A. Colonization policies in the Peten

WHAT DOESN'T WORK

Land colonization programs and infrastructure projects (e.g. road construction) created incentives for felling of forests to plant basic grains and graze cattle. Forest removal causes wildlife habitats to deteriorate.

Large-scale timber operations lead to deforestation, which damages ecosystems and reduces wildlife populations.

B. Agrarian Transformation Law

WHAT DOESN'T WORK

By making lands available to the private sector, agricultural and forestry (lumber and firewood) production damages wildlife habitats.

Agricultural and forestry production destroys genetic resources that have potential but currently unknown economic benefits.

4.4 Research Agenda

4.4.1 Endangered Species Policies

- Identify species in danger of extinction and develop conservation programs for these species.
- Conduct protected species ecosystem studies.
- Examine means to stimulate commercial planting of protected species.

4.4.2 Protected Areas Law

- Examine ways to incorporate community attitudes, goals and activities into the implementation stage of the law.
- Study economic activities in protected areas to develop culturally and ecologically appropriate long-term use policies.
- Examine successful buffer zones in other countries to develop by-laws and buffer zone categories using a "sustainable management" approach.
- Consider reducing the coverage of the law to areas with strong ecotourism potential, limited forestry and agricultural value, low population pressures, and wetlands of international importance.
- Examine ways to better coordinate activities of public and private sector environmental groups.

4.4.3 Tourism

- Study potential growth in ecotourism market, develop strategies to promote ecotourism and define INGUAT's role and resource needs.
- Study and develop other tourism programs that also develop and conserve natural resources.

4.5 Actions to be Taken

- Regional coordination needed for the following:
  - Dissemination of information on endangered species,
  - Regional tourists, and
  - Regional parks.
- Promotion of ecotourism that benefits local communities.
- Strengthen institutional presence of DIGEBOS, CONAP, INTA, CONAMA, in the Peten.
- By-laws and regulations are needed to support the Protected Areas Law.

5.0 CONCLUSIONS

Although these prevailing patterns and policies of development in Guatemala have been formed with positive intentions and have created some beneficial outcomes, it is also now recognized that the prevailing approaches have many long-run negative effects on the natural resource base. This path of development may have encouraged deleterious practices of resource exploitation and contributed to serious environmental degradation.

Policies directly addressing environmental or natural resource issues have helped to some extent to alleviate certain problems, but it has become clear that many of the existing policies are ineffective because of being ill-conceived, unenforced, or constrained by contradictory policies and conflicting political-economic pressures. The crucial constraint in effectiveness is that the policies often fail to address and confront the underlying causes of skewed distribution of political power and economic resources, population pressures and poverty.

One of the main challenges in forming new development strategies is balancing environmental conservation with pressing goals for economic growth. Innovative policies must be designed to mesh environment and development objectives. In some cases, conflicts arise and difficult choices and trade-offs must be made between conservation concerns and narrower growth objectives, and between long-term and short-term interests. However in the majority of cases, these two objectives are mutually reinforcing. That is, sound resource use conservation measures and pollution prevention strategies usually pay off both economically and socially and they also can help ensure sustainability of production. Moreover, progressive changes in resource-use policy (such as support or agroforestry or soil conservation) can sometimes open up new economic possibilities; they may lead to structural changes in production, new jobs, or new markets and trade opportunities for producers.

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GUATEMALA NATURAL RESOURCE POLICY INVENTORY USAID/ROCAP RENARM PROJECT

VOLUME II

THE INVENTORY

APRIL 1990

TECHNICAL REPORT NO. 108

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PREFACE

Purpose of the Report

Natural resource management for sustainable development is particularly needed in the region of Central America, where severe problems of environmental degradation are inextricably connected to economic crises and political instability. In recent years numerous studies, reports, and articles have documented and drawn attention to predicaments of resource deterioration in Central America -- from deforestation and soil erosion to agrochemical pollution -- and to the debilitating socio-economic problems they have generated. The international community has recognized the urgent need to change the prevailing patterns of resource exploitation and to pursue new directions of sustainable economic development and natural resource conservation in this region. Governments, non-government organizations and international donors have begun to develop policies and projects to resolve these seemingly intractable dilemmas.

The Regional Environmental and Natural Resource Management Project (RENARM) is a comprehensive new ten-year effort to address these problems. Its central goals are to help create "conditions for sustained use of natural resources in a manner that minimizes damage, protects biodiversity, and provides the means for equitable and sustainable economic growth," and to "assist public and private institutions to generate, transfer and apply the information and technologies essential for sustained use of natural resources." The development of natural resource policies is a crucial component of RENARM, which will complement and shape the other components (i.e. education, wildlife conservation, sustainable agriculture and forestry, and institution building). The policy component is based on the following premise:

> "Attention to the political and legal framework which governs economic policies, regulations, enforcement, land use, economic incentives and environmental protection is a required element for successful strategies. Project interventions and long-range planning cannot proceed effectively without support and compatible policies and laws." (RENARM, 1989)

The objectives of this component are to help create effective public policy and enforcement measures conducive to sustainable resource use, overcome policy constraints that jeopardize the environment and development, promote policy dialogue between governments and donors, and support constructive processes of policy-making for this purpose. The expected products include new legislation with effective enforcement measures, improved inter-agency cooperation, greater awareness of environmental policy issues, and incentives for improved management of land, watersheds, energy, fisheries, agrochemicals, forests, and wildlands.

In order to fulfill RENARM's ambitious goals, it is first essential to understand the existing policy environment and the political, economic and social context that circumscribes and determines natural resource management and conservation in the region. Implementing improvements in this area is unfeasible without fully comprehending the past and present strategies or lack thereof and the socio-economic forces related to resource use activities, problems and policies.

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A policy inventory providing essential background information for this purpose entails the following tasks:

a) identifying all policies and laws from both the public and private sectors at the regional, macroeconomic, and local levels which affect natural resources (including those pertaining to the economy, commerce, agriculture, forestry, energy, and industry);

b) identifying institutions and agencies (both government and non-government) that create and implement such policies;

c) conducting a qualitative assessment of the impacts of each policy on economic growth and the natural resource base in both the short and long run; and

d) analyzing the interactions of these policies, discussing significant gaps in the current policy set and determining principal policy alternatives for a research agenda.

Natural resource policy inventories will be conducted for Guatemala, Belize, Honduras, El Salvador, Costa Rica and for the Central American region as a whole. This report presents the results of the policy inventory for Guatemala.

Policy analysis is the second step within the policy component of the RENARM strategy. The inventories will contribute to the preparation of country-specific strategies for implementing RENARM. The policy analysis component of RENARM will analyze alternative environmental and natural resource policy options indicated in the inventories; adapt, improve and evaluate a range of methods for analyzing policy options; and characterize the political/institutional milieu in which policies are developed and implemented. The policy analysis component supports the policy dialogue and reform required to achieve RENARM's objectives.

Background Context of the Policy Inventories

Concern for the environment arises at a time when the energies of Central American countries are devoted to development goals that highlight expansion of production and alleviation of poverty. However, through the global economic crises, deepening debts, and declining terms of trade of the last two decades, the governments of Central America have faced increasing economic pressure to expand export production, repay burgeoning loans, and raise gross national product (GNP) in the short term. Governments have established policies and laws, including fiscal measures (such as taxation and subsidies), credit systems, colonization schemes, and customary land use legislation, which often maximize short-term profits and rapid growth. Large-scale monocultural enterprises, such as beef-cattle and cotton, and small-scale export crops have received particularly strong state support. These sectors have contributed greatly to the increase of exports, thereby generating badly needed foreign exchange.

The main objective of the policy inventory is to prioritized avenues of policy reform in which the goals of environmental conservation and economic growth are compatible. However, there are no "blueprint" policies and actions

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to resolve these complex dilemmas. The citizens and leaders of the individual countries need to adapt policy measures to their own situations.

At the same time, these countries urgently need to collaborate and learn from each other in the process of identifying successful measures. Some environmental and natural resource problems are regional predicaments that do not observe national boundaries. Inter-country exchange of information and formation of region-wide policies are essential initiatives that serve the interest of all Central American people.

The RENARM initiative of conducting policy inventories for natural resources in five Central American countries and one for the region as a whole was designed with these concepts in mind.

Contents of the Report

Volume I is a concise summary of the results and conclusions of the Guatemala Natural Resource Policy Inventory. It is non-technical and geared for a wide audience. Illustrative examples are used to support the inventory's main conclusions.

Volume II is organized into chapters that progressively build support for the final chapter's recommendations for subsequent policy analysis of natural resource issues in Guatemala. In Chapter 1, the inventory clearly defines the terms policy and natural resource. Structure for the inventory is created by dividing policies into three major categories and identifying four major natural resource problems. This report connects natural resource issues to patterns of human behavior. Problems of water pollution, habitat destruction, and soil degradation cannot be isolated from factors that motivate people to misuse their natural resources.

Chapter 1 also introduces the inventory's main theme, that Guatemala's poverty and skewed resource distribution are indirectly the fundamental causes of the country's natural resource problems.

In Chapter 2, the report develops its main theme more rigorously. Political, social and economic factors that frame Guatemala's policy environment are discussed. The country's political instability is briefly traced and related to the public sector conditions required for sound resource management. The skewed distribution of political power across the population is described. Centralized decision making and weak legal and institutional structures are presented as significant constraints to promoting rational natural resource management policies. Also, the degree and form of citizen participation in policy dialogue on natural resources is discussed and the implications from the lack of a national development strategy on natural resource management policies are presented.

Secondly, the distribution and mobility of land, capital and human resources is described. Poverty and its implications on formulating natural resource management policies is emphasized.

Finally, the significance of cultural and education factors in implementing natural resource management policies are discussed.

Chapter 3 is devoted to a description of the role of Guatemalan institutions that participate in natural resource policy-making. For each natural resource policy category identified in Chapter 1, the main formal institutions at international, regional, public and private levels, and their interactions are briefly described with the aid of charts. A discussion that highlights the degree of institutional complexity, coordination and cooperation with respect to a natural resource category proceeds each chart. Chapter 3 concludes with a discussion of how institutions coordinate activities that cut across natural resource issues, such as integrated resource management and environmental impact assessments.

Chapter 4 summarizes the results of the policy inventory. First, the role of Central American regional policies and international agreements affecting Guatemala's natural resources is discussed. Secondly, Guatemala's macroeconomic policies, particularly recent reforms, are analyzed as they relate to the country's natural resource base. Finally, Policy Inventory Tables for sector and subsector policies are summarized. For each natural resource category, the main policies' effects on the economy and the environment in the short- and long-run are analyzed. The analysis of the social, cultural, institutional and political factors discussed in Chapter 2 and 3 are incorporated into the study. Cases where policies do not exist or are not implemented properly are also highlighted. Chapter 4 concludes with a brief discussion of interdependent natural resource policy issues.

Chapter 5 outlines a series of policy priorities that need further analysis, based on several factors:

a) the political, social and economic feasibility for policy reform;

b) the potential severity of the socio-economic and environmental impacts of policy reform; and

c) the ability of the policy reform to close the gap between objectives of economic growth and a long run sustainable natural resource base.

Conclusions drawn from the inventory are presented in Chapter 5.

Information useful for subsequent research in this area is provided in Appendices A - C at the end of Volume II. Over 80 people were interviewed for this study in Guatemala and the United States. Their names, addresses and phone numbers, when available, are presented in Appendix A. A list of over 250 documents obtained for this study and the sources of the information is provided in Appendix B. Finally, the names and brief background descriptions of the main contributors to this report are provided in Appendix C.

Volume III contains two technical appendices. Technical Appendix A presents the policy inventory tables that support the policy discussions of

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Chapters 4 and 5 of Volume II. Each table describes a policy and its objectives, cites the main institutions implementing or creating the policy, makes a qualitative assessment of its impact on economic growth and the natural resource base and briefly explains the assessment, and lists policy alternatives or issues requiring further research. Technical Appendix B briefly describes the characteristics and objectives of over ninety public, private, and international institutions and universities active in Guatemala's natural resource policy environment.

Summary

This inventory was conducted to gain a comprehensive understanding of the specific influences of all relevant policies, or lack thereof, and the political, institutional, social and economic factors which surround natural resource conditions. These policy influences are largely qualitative matters, often involving incommensurable factors of political power, social, and economic forces. Seldom can they be documented quantitatively. Yet this complexity does not discount their importance. Further research on policies will be needed over time to clarify the impacts and assess new responses and evolving conditions. The inventory of policies in this report is designed to fulfill the need for better information on existing strategies which will help stimulate the design of policies and actions for sustainable, equitable development and natural resource management in Guatemala and the entire Central American region.

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There were several people, in addition to the main authors, who significantly contributed to the content of this report. Appendix C provides a brief description of their backgrounds. The Asociacion de Investigacion y Estudios Sociales Guatemala (ASIES), which provided technical and logistic support for the study, is gratefully acknowledged. The team would like to thank the many people and institutions who provided information, frank opinions, and helpful comments. In addition to the people interviewed during this study listed in Appendix A, we would like to acknowledge Cesar Linares, Guillermo Toro and Lori Ann Thrupp and the support of the USAID/Guatemala mission and USAID/ROCAP. In particular, Al Nakatsuma, Ron Curtis, Ron Nicholson, Sam Skogstad, and Jack Vaughn made numerous valuable comments and suggestions. Comments made at the ROCAP seminar in Costa Rica by representatives from the Central American USAID missions were also quite helpful. Reviews by Charles Hanrahan, Cheryl Christensen and Rubin Nunez, and editing by Bill Levine and Paula Hirschoff at Abt Associates in Washington, D.C. are gratefully acknowledged.

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ABSTRACT

Under The Regional Environmental and Natural Resource Management Project (RENARM), USAID/ROCAP funded country case studies of policies affecting the management of natural resources in Central America. Volume I of this report is a concise summary of the results and conclusions of the Guatemala Natural Resource Policy Inventory. It is non-technical and geared for a wide audience. Illustrative examples are used to support the inventory's main conclusions. Volume II presents the analysis of the study: it defines the terms policy and natural resource, it discusses the political, economic and social factors framing the natural resource management policy making and implementation processes in Guatemala, it analyzes the interactions among institutions involved in the policy process, and presents the major findings and policy recommendations of the study. Volume III provides a brief description of over ninety public, private, and international institutions and universities active in Guatemala's natural resource policy environment and presents policy inventory tables. Each table identifies a significant natural resource management policy and the institutions mandated to implement the policy, makes a qualitative assessments of the impact on economic growth and the natural resource base, and lists policy alternatives suggested for future analysis.

In addition to the analysis of regional and macroeconomic policies, over fifty sector policies were identified as having a significant impact on the management of Guatemala's natural resources. Problems of lack of laws, institutional overlap, and insufficient resources for enforcement of policies were identified and highlighted.

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LIST OF ACRONYMS

AGMIP	Guatemalan Association for Integrated Pest Management
AID	Agency for International Development
AIFLD/CUSG	American Institute for Free Labor Development/Guatemalan Confederation for Union Unity
AIMPE	Association of Wood Industrializers of the Peten
ANAM	National Association of Municipalities
APRODEMA	Guatemalan Association in Defense of the Environment
ASIES	Guatemalan Association of Social Research and Studies
BANDESA	Agricultural Development Bank
BANEX	Export Bank
BANGUAT	Bank of Guatemala
CACIF	Chambers of Commerce, Industry and Finance
CAMINOS	General Directorate of Roads
CAMTUR	Chamber of Tourism
CATIE	Tropical Agricultural Research and Training Center
CCAD	Central American Commission on Environment and Development
CECON	Center for Conservation Studies
CELGUSA	Celulos of Guatemala, Inc.
CELMOSA	Celulos of Motagua, Inc. (previously CELGUSA)
CEMA	Center for Ocean and Aquaculture Studies
CEMAT	MesoAmerican Study Center for Appropriate Technology
CIAT	International Center of Tropical Agriculture
CICP	Consortium for International Crop Protection
CITE	International Commerce of Endangered Wildlife Species
COGUANOR	Guatemalan Commission of Norms

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CONACOEX	National Coordinating Commission of Exports
CONACOMIP	National Integrated Pest Management Consulting Committee
CONAMA	National Environmental Commission
CONAMCUEN	National Advisory Commission for Watershed Management
CONAP	National Council for Protected Areas
CONAPEX	National Commission for Nontraditional Products
CONATIERRA	National Land Commission
CONFECOOP	Confederation of Cooperatives
COPECAS	Permanent Coordinating Committee for Drinking Water Supply and Sewer Services
CORECA	Agricultural-Livestock Regional Committee
COREDA	Regional Coordinating Committee
CORFINA	National Financing Corporation
CORPECAS	Permanent Coordinating Committee for Drinking Water Supply and Sewer Services
COSUCO	Superior Coordinating Committee
COSUSPA	Superior Coordinating Committee of the Private Agricultural - Livestock and Food Sector
COSUREDA	Sub-regional Coordinating Committee
DAI	Development Alternatives, Inc.
DGOP	General Directorate of Public Works
DIGEBOS	General Directorate of Forest and Wildlife
DIGESA	General Directorate of Agricultural Services
DIGESEPE	General Directorate of Cattle Services
DIRYA	Technical Directorate of Irrigation and Drainage
DITEPESCA	Technical Directorate of Fishing
DRI	Integrated Rural Development
DTSV	Technical Directorate for Plant Health

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EIA	Environmental Impact Assessment
EMPAGUA	Municipal Water Enterprise for Guatemala City
ERIS	Regional School for Sanitation Engineering and Water Resources
FAO	Food and Agriculture Organization
FAUSAC	Faculty of Agronomy, University of San Carlos
FECOAR	Regional Agricultural Cooperatives Federation
FEDECOCAGUA	Federation of Coffee Cooperatives of Guatemala
FTN	Transversal Northern Strip
FUNDACEN	Penny Foundation
FYDEP	National Company for the Economic Promotion and Development of the Peten
GACILA	Consulting Group of the National Commission of Boundaries and International Waters
GEXPRONT	Nontraditional Export Products Association
GIFAP	International Group of National Associations of Agr Chemical Products Companies
GREPAGRO	Agricultural Products Distributors Guild
HAD	Highland Agricultural Development Project
ICAITI	Central American Institute of Industrial Research and Technology
ICTA	Agricultural Science and Technology Institute
IDAEH	Archaeology and History Institute
IDB	International Development Bank
IGSS	Guatemalan Social Security System
IGM	Military Geographic Institute
IGN	National Geographic Institute
IIA	Institute of Agronomy Research

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IICA	Interamerican Institute for Cooperation in Agriculture
INACOOP	National Institute for Cooperatives
INAFOR	National Forestry Institute
INCAP	Nutrition Institute of Central America
INDE	National Institute of Electrification
INDEAH	Institute of National History and Anthropology
INDE	National Electrification Institute
INDECA	National Agricultural Marketing Institute
INFOM	Institute of Municipal Promotion
INGUAT	National Tourism Institute
INSIVUMEH	Institute of Seismology, Volcanography, Meteorology and Hydrology
INTA	National Agrarian Transformation Institute
INTECAP	Technical Training Institute
IPM	Integrated Pest Management
IUCN	International Union for Conservation of Nature
LUCAM	Laboratorio Unificado de Control de Alimentos y Medicamentos
MAGA	Ministry of Agriculture, Livestock and Food
MOSCAMED	Mediterranean Fruit Fly Program
NGO	Non Governmental Organization
OAS	Organization of American States
OCREN	Office of National Reserves Control
OECD	Organization for Economic Cooperation and Development
OIRSA	International/Regional Organization for Agricultural-Livestock Health
PAFG	Guatemalan Tropical Forestry Action Plan
PCV	Peace Corps Volunteers
PNUD	United Nations Development Projects

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PRODAC	Agricultural Diversification and Marketing Program
PROLAC	Milk Products Enterprise of Asuncion Mita
PROMECAFE	Programma de Promocion de Cafe Production
PVO	Private Voluntary Organization
RENARM	Regional Environmental and Natural Resource Management Project
ROCAP	Regional Office for Central American Programs
SEGEPLAN	General Secretariat of the National Economic Planning Council
SGCNPE	Secretary General of the National Council for Economic Planning
SIGAP	Guatemalan Protected Areas System
UNDP	United Nations Development Project
UNEP	United Nations Environmental Program
UNEPAR	Executing Unit of the Rural Aqueducts Program
UNEPET	Executing Unit of the Peten
UNESCO	United Nations Education, Social and Cultural Organization
URL	Rafael Landivar University
USAC	University of San Carlos
USAID	U.S. Agency for International Development
USPADA	Sector Planning Office for Food and Agriculture
WHO	World Health Organization
WWF	World Wildlife Fund

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1.0 AN OVERVIEW OF GUATEMALA'S NATURAL RESOURCE ISSUES

1.1 Definitions of Policy and Natural Resources

The first step in conducting the Policy Inventory is to define the two basic parameters of the study: policies and natural resources. To provide structure to the Inventory, categories for the policies and the natural resources are created.

1.1.1 Policies

Policies are defined as rules designed to influence human behavior, which are created by members of the society, collectively or individually. This very general definition covers not only formal policies of official government institutions, but also policies emanating from the private sector and from a society's traditional and cultural practices. The latter two sources often fill the gaps found in government policies or laws. Therefore, this inventory defines relevant gaps in the policy framework as well as identifying the policies themselves.

This study has three major policy categories:

- Regional
- Macroeconomic
- Sector and Subsector

Regional Policies. These policies include multilateral and bilateral agreements between the governments of Guatemala and other Central American countries and international treaties, agreements and protocols that Guatemala has signed.

Macroeconomic Policies. This category is divided into monetary and fiscal policies. Monetary policies include interest rate, credit, inflation and exchange rate policies. Fiscal policies are concerned with tax and financing public deficit policies.

Sector and Subsector Polices. These policies are divided into four subcategories:

- Fiscal
- Trade
- Regulatory
- Development

Fiscal policies concern taxes placed on specific sector activities, trade policies concern all price and non-price restrictions on imports and exports, regulatory policies include laws and regulations; and development policies are mostly concerned with issues of land colonization, land reform, agroforestry management projects, and infrastructure development (i.e. irrigation, hydroelectric plants, roads, potable water).

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Regional and macroeconomic policies, because their objectives, tools and effects transcend sectors within the economy, will be analyzed separately from sector specific policies. The effects from regional and macroeconomic policies on the natural resource base as a whole will be analyzed as opposed to a separate analysis of the effects for each of the four natural resource categories.

In contrast, sector specific policy objectives are narrower and their effects on specific natural resource categories are more easily isolated. Thus, for each major sector specific policy identified, a qualitative assessment of the impact on each relevant natural resource category and on economic growth in the long and short run is made and presented in a Policy Inventory Table compiled in Volume III. Discussion of these results are presented in Chapters 4 and 5 of this Volume.

1.1.2 Natural Resources

Natural resources as discussed in this inventory are restricted to the country's renewable resources. These resources will be addressed individually and collectively in the analysis. Policy effects on soils, water, forests, and wildlife will be studied, as well as on sustainable agriculture, ecosystems, and management of forests, wildlands and watersheds. This two-tier approach recognizes that policy reform design requires a micro analysis of effects on individual resources, as well as an analysis of the impact on systems of natural resources.

This study categorizes natural resources into four components:

- Sustainable agriculture
- Production from natural forests
- Watershed management
- Management of wildlands

These categories provide structure to the Policy Inventory Tables, the subsequent discussion of policy issues, and the identification of areas for further policy research. The specific issues that they encompass are briefly discussed below.

Sustainable Agriculture. In this report, sustainable development in the agricultural sector is defined as the management and conservation of the natural resource base and the orientation of technological change to ensure the attainment and continued satisfaction of human needs -- food, water, shelter, clothing and fuel -- for present and future generations. Such sustainable development conserves genetic resources and land and water resources, and is environmentally non-degrading, technically appropriate, economically viable and socially acceptable (FAO 1988, p. 135).

Issues related to pest and pesticide management, habitat destruction and disruption related to agriculture and biodiversity losses, rural poverty, poor

water management and soil erosion are discussed under this category.

Production from Natural Forests. Production from natural forests is concerned with the management of forested areas that have high potential for the sustainable production of forest products, water and other environmental benefits (RENARM, 1989).

Issues related to deforestation and habitat destruction, disruption, and biodiversity losses related to forest production are discussed under this category.

Watershed Management. Management of water resources is concerned with all water bodies: rivers, lakes, coastal zones, seas and oceans. This category includes the management of critical watersheds, which refers to the improved use of natural resources of watersheds, emphasizing upland areas. This part of a watershed has direct downstream impacts on infrastructure, agriculture, water supply, and coastal areas.

Issues related to soil loss and sedimentation, water management practices, quantity and quality of water supply, water distribution, irrigation, loss of lands from excess flooding, and refuse disposal practices are discussed here, together with hydroelectric power, fishery and coastal zone issues.

Management of Wildlands. Management of wildlands refers to the consolidation and management of legally declared national parks and reserves on a sustainable basis. Wildlands preserve biodiversity, tropical forests and the heritage of the human race. The wildlands provide clean water, a productive and stable coastal zone, an attraction for tourists, and habitats for diverse species of plants and animals (RENARM, 1989).

Issues related to habitat destruction and disruption, tropical forests, mangroves, hunting and gathering, ecosystems, and biodiversity are discussed under this category.

1.2 Incorporation of Poverty and Resource Distribution Issues

The main theme of this report is that Guatemala's poverty and skewed resource distribution are indirectly the fundamental causes of the country's natural resource problems. This theme is introduced in Chapter 2 as part of the "situation" affecting natural resource management and distribution. In Chapters 4 and 5, poverty and resource distribution pressures on natural resources are directly integrated into each of the four resource categories defined above, thereby recognizing that *poverty and skewed resource distribution are a cause as well as a result of inadequate natural resource management.* Because this issue is incorporated into most of the analysis of this report, it will significantly influence the identification of research priority areas.

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1.3 Guatemala's Natural Environment[1]

This section of the report describes Guatemala's topology, climate and ecosystems and how they relate to the country's supply of natural resources, across both time and space. Guatemala has 23 types of climate, four major geographic areas, and 14 main ecological zones. This section demonstrates that *policy analysis, dialogue, and implementation must take into account the wide diversity of natural resource conditions throughout the country.*

Guatemala covers 108,889 km2 of land and shares borders on the north and west with Mexico; on the east with the Caribbean Sea and the countries of Belize, Honduras and El Salvador; and on the south with the Pacific Ocean. Figure I-A illustrates Guatemala's borders and the locations of its main cities and 22 departments.

1.3.1 Topological Diversity

Figure I-B illustrates the main geographical sites in Guatemala. Because of its position atop three tectonic plates, Guatemala has a history of geological instability. There are 33 volcanoes, several of which are active; 144 earthquakes have occurred since 1881 (Basterrechea, 1988). In addition, the country's location between the tropical and subtropical regions and elevation ranging from sea level to over 4,000 meters provide climatic and ecological diversity.

1.3.2 Climatic Diversity

Based on Thornwaite's classification system, there are 23 types of climate in the country (Aragon, 1987) (Figure 1-C). Over the past 10 years, the average annual rainfall in Guatemala has been 286,868 billion cubic meters with the coefficient of variation for annual precipitation falling between 0.10 and 0.18. Forty-five percent of this rainfall becomes superficial runoff.

Although rainfall varies little from year to year, its distribution across the country and within the calendar year is highly skewed (Figure 1-D). Rainfall ranges from an average of 500 mm/year in the upper Motagua valley to 6,000 mm/year in the Atlantic Lowlands. Across the country, 60% to 80% of the annual rainfall occurs between May and October. However, some regions in the north, such as Alta Verapaz and Baja Verapaz, average between 200 and 210 days of rain per year, while areas in the east, such as El Progreso, Zacapa and parts of Chiquimula, average between 45 and 60 days of rain per year. Intense storms and sudden downpours occur throughout the territory during the rainy season. Winds, however, rarely exceed 80 km/hr in any part of the country.

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[1] This section is mostly based on The Consortium for International Crop Protection, "Guatemala Medfly Environmental Impact Analysis." Guatemala: A.I.D./CICP 1988), p. 9 ff; and IICA, "Informe final de la Ejecucion Tecnica y Financiera de los Proyectos de Emergencia Convenio No. 10-87 MAGA-IICA." May 12, 1987 - May 30, 1988, except when otherwise referenced.

Average temperatures vary across the country, ranging from 10 C in the highlands to 25 C on the Atlantic coast and 27 C on the Pacific coast. Temperatures peak between April and August.

1.3.3 Ecological Diversity

Based on Holdridge's classification system, Guatemala has 14 ecological zones (De la Cruz, 1976) as illustrated in Figure 1-E.

Guatemala is a transition zone between the northern Nearctic and southern Neotropical fauna. Diversity in animal species and plant life characterizes both faunal zones. The Latin American Program of the Nature Conservancy lists 1,156 terrestrial vertebrate species in Guatemala: birds, 679; mammals, 174; reptiles, 204; and amphibians, 99.[2] Migratory birds in Guatemala include 134 temperate North American and Mexican species in winter and an additional 38 species in autumn or spring. An estimated 220 fauna species live in Guatemala's fresh waters; in some areas, they are almost extinct from overfishing, pesticide contamination, and introduction of exotic species. In other areas, they are not being exploited at all. With respect to plant life, Guatemala has an estimated 8,000 species of vascular plants.

Most of these species are decreasing in population and some are almost extinct. According to the Latin American Program of the Nature Conservancy, 4% (46) of the vertebrate species were considered endemic in 1988. Almost 15% of the vascular plant species in Guatemala are endemic. In the high mountain regions, which provide the only livable environment for certain species, approximately 70% of the vascular flora is endemic. In 1988, 57 endangered or threatened species of animals and plants were identified by various private and governmental sources (The Consortium for International Crop Protection, 1988, p. 13). Much of the wildlife deterioration is due to habitat destruction, overexploitation and hunting.

Under Guatemala's Protected Areas Law, 50 areas are designated protected, although the classification is not based on international standards (IICA, 1987-88). Also, many of the areas are not managed. Six of these areas are biotops, which are designed to protect specific species of animals. The biotops are managed by the Center for Conservation Studies, University of San Carlos.

1.3.4 The Natural Resources

The tremendous diversity in topology, climate and ecosystems within a relatively small area has significant consequences for the distribution of Guatemala's natural resources, across both time and space. Thus, even before the human element enters the picture, natural resource policy formulation and implementation issues must be disaggregated on a geographic basis. The following section describes the water, soil and forest resources in Guatemala, emphasizing that natural resource problems based on physical environmental factors are very location-specific.

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[2] A second inventory of wildlife in Guatemala concluded that there are 250 species of mammals; 664 birds; 231 reptile; 88 amphibians (IICA, 1988).

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Water Resources. The mountain range, Los Cuchumatanes, cuts Guatemala's water network into two main systems: the Atlantic and the Pacific. Within these two systems are three main water basins: one draining into the Gulf of Mexico, one into the Caribbean Sea, and the third into the Pacific Ocean. The Gulf of Mexico basin is formed by slow moving rivers over flat terrain that form nine watersheds with an area of 50,803 km2. Its permeable soils support an extensive and important underground network of waters in the Peten. The Caribbean basin includes four large watersheds with deep, rapid rivers that flow into the sea, covering 34,096 km2 of area. The southern basin has a total of 17 watersheds, with an area of 23,990 km2. Its small rivers, flowing from the Sierra Madre mountain range, are characterized by strong currents, steep gorges and waterfalls.

Guatemala has over 300 lakes covering 1,000 km2. Lake Izabal in the Atlantic Watershed (590 km2) and Lake Atitlan in the Pacific Watershed (130 km2) are the largest.

Based on volume, the principal rivers are Usumacinta Salinas, Motagua, Sarstun, Polochic-Dulce, Suchiate, Madre Vieja, Maria Linda, Los Esclavos and Paz. The largest river, Usumacinta, with a basin of 51,538 km2, flows into the Gulf of Mexico. The Motagua has the largest basin (14,453 km2) in the Atlantic Watershed. In general, these rivers have the capacity to generate electricity and provide water for drinking, industrial production, irrigation, and fish cultivation.

The water system's volume is high during the rainy season of May to November, peaking between September and October. The distribution of water resources in Guatemala is variable not only in time but in space. There are very humid areas with water levels adequate to support the wildlife, while water resources are scarce in the arid eastern part of the country (Aragon, 1987).

Over the years, the per capita water available for human consumption has drastically diminished from 24,531 m3 of water/person/year or 0.78 liters/second/person in 1968 to 0.25 l liters/second/person in 1987 (Aragon, 1987).

In addition, Guatemala has limited but important marine resources in two coastal strips: 170 kilometers along the Pacific and 240 kilometers along the Atlantic. Because marine coastal fauna in the Pacific Ocean region is scarce, strict enforcement of regulations is required to protect the marine resources (Matthes, 1986). The shrimp industry is the most important economic activity. According to a study by Bovay Engineers, Inc. (1975), the maximum sustainable exploration of shrimp is estimated at 1,650 metric tons per year; however, shrimp production reached 2,272 metric tons in 1984 and 1,816 in 1985 (DITEPESCA, 1985). The destruction of the mangroves, the contamination of the coastal zone, the diminishing size and productive capacity of the estuaries, and the capture of larva for shrimp farms are the principal causes of resource depletion in this region (Castaneda, personal communication 1990).

Guatemala's national Pacific coastal waters cover 91,600 km2. This zone has the potential to provide 7,850 metric tons of benthic marine life per year;

however, the sustainable level is 60%, or 4,700 metric tons per year. Its pelagic marine resources include squid, sardines, tuna and other fish. However, productivity from this resource is relatively low, estimated at 1 kg/hectare/year in 1986 (Matthes, 1986).

As in the Pacific Ocean, the Atlantic has limited marine life. However, its economic productivity is much higher. Although there are no formal studies, Matthes (1986) estimated that 10 kg/hectare (or 2,100 metric tons) of marine life are produced per year. According to a study by Salaverria (1987), these resources are not being exploited to their optimal level.

Soils. Hillside and highland zones comprise 82% of the total land area of Guatemala; of these, 35% are good, deep soils, 14% poor deep soils, and 51% thin soils (the Consortium for International Crop Protection, 1988). According to the FAO/UNESCO system of soil classification, Guatemala has 13 types of soil. A total of 58% of the soil is suitable for forest production, 15% for protected areas and 26% for sustained agricultural production (IICA, 1987-88).

The country can be divided into four large geographic regions: the Pacific coastal plain, the Pacific mountain range, the interior highlands, and the lowlands of the Peten-Caribbean (Figure 1-B).

The Pacific coastal plain, approximately 240 km long and 60 km wide, ranges in altitude from sea level to over 850 meters high. It includes river valleys with highly productive fertile soils for agriculture.

The craggy Pacific mountain range, part of the volcanic Andean chain, runs parallel to the ocean. The elevations in this geographic region range from 850 to 4,200 meters above sea level. It includes two ecological sub-regions, foothills and cloud forests. Although the soils in this region are fertile from their volcanic origin, they are highly susceptible to erosion due to the craggy geography and intense precipitation.

The interior highlands contain almost 50% of the country's surface area. The region is geomorphologically heterogenous, containing high plains, valleys and flood lands. Eleven of the fourteen ecological zones are located in this region. These ecosystems vary from the high barren sub-alpine plains of the Cuchumatanes to the thorny brush of the Motagua River watershed. The productive potential of its soils varies, but the majority of the land is not suitable for sustained agriculture. The high population density and the people's dependency on its resources for subsistence has resulted in significant environmental degradation.

The lowlands of the Peten-Caribbean encompass parts of the Departments of Huehuetenango, Quiche, Alta Verapaz and Izabal and all of the Department of Peten. The soils are calcarious and the landscape is karstic. In general, these soils are not conducive to sustained agricultural production. Soils covered with lowland forests are highly productive in the short run but rapidly deteriorate when farmed intensively. In spite of policies and programs that have promoted land clearing for agriculture, the region still has dense broadleaf forests and a few remnants of coniferous forest formed by small communities of Pinus caribaea.

Across the country, the majority of soils are susceptible to erosion (Table 1-F). In addition to the rains and geographic characteristics, inadequate management of soils causes erosion problems. Forty percent of loss in soil fertility has been attributed to deforestation (Arana, 1989). Although no rigorous studies exist on soil loss, registered data show the magnitude of the problem in some watersheds. Rossal (1982) estimated an average loss of 0.01 cm/year in the Samala watershed; 0.12 cm/year in the Villalobos River; and 0.08 cm/year in the Chixoy River. In contrast, some rivers flowing into the Atlantic average losses of 0.0005 cm/year and 0.0023 cm/year (Castaneda et al. 1982).

Forests. Escobar (1989) estimates that between 28% and 40% of Guatemala is covered by forests of which approximately 70% are broadleaf and 30% are coniferous. Approximately 40% of this cover lies in the country's temperate zone and includes 16 species of coniferous trees and 450 species of broadleaf trees. Much of the remaining forestland is secondary growth common in the transition zones between lowlands and highlands.

Mangroves are ecosystems composed of broadleaf trees and various types of plant life found along waterbeds. Although mangroves cover only 0.2% of Guatemala's total area, proper management of these ecosystems can bring significant economic benefits. Most of these mangroves, 254 km2, are located in the Pacific coastal zone in the departments of Santa Rosa (74 km2), Retalhuleu (66 km2), Escuintla (56 km2), Jutiapa (47 km2), and San Marcos (11 km2) (IICA, 1987-88).

The degree of deforestation in Guatemala is not precisely known. Between 1970 and 1980, Guatemala's woodland and forest land declined by an estimated 11% (the Consortium for International Crop Protection, 1988). In rural lands, there were only 0.11 hectares/person of forest in 1982, down from 1.82 hectares/person in 1964 (Arana, 1989). Throughout the country, between 325.5 km2 and 343.0 km2 of forests are lost annually, after accounting for natural regeneration and reforestation (Universidad Rafael Landivar 1987 and Escobar 1989). Firewood accounts for approximately 65% of the extraction (Universidad Rafael Landivar 1987 and Escobar 1989). Other estimates of demand for firewood show that 1 ton/person/year is consumed (Arana, 1989).

These deforestation trends have implications for the long-term productivity of the forests. Of the 6.1 million hectares classified as productive forestland, less than half was forested in 1984. And of the 1.3 million hectares of protected forestland, only slightly over half was covered by forest (PNUD/FAO/INAFOR project, 1984).

Interdependencies. Natural resources are highly interdependent: improper management of one resource has negative spillover effect on other resources. For example, Guatemala's pine forests are poorly managed according to many forest experts. They are the location of important headwaters in watersheds and contain a great variety of tree and other flora species endemic to Guatemala. Poor management of some of these areas has led to significant downstream effects in the southern coast, one of the more important agricultural areas in the country. Within the southern coastal region, erosion from poor management as well as flooding from watersheds is also negatively affecting its resource base. In addition, pesticide contamination from improper agricultural practices is extensive, affecting the coastal mangrove system. Watershed reforestation and sustainable agricultural practices in the upper watersheds will be needed to prevent further deterioration and loss of this resource base.

Figure I-A
POLITICAL MAP OF GUATEMALA

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Figure I-B
GEOGRAPHIC MAP OF GUATEMALA

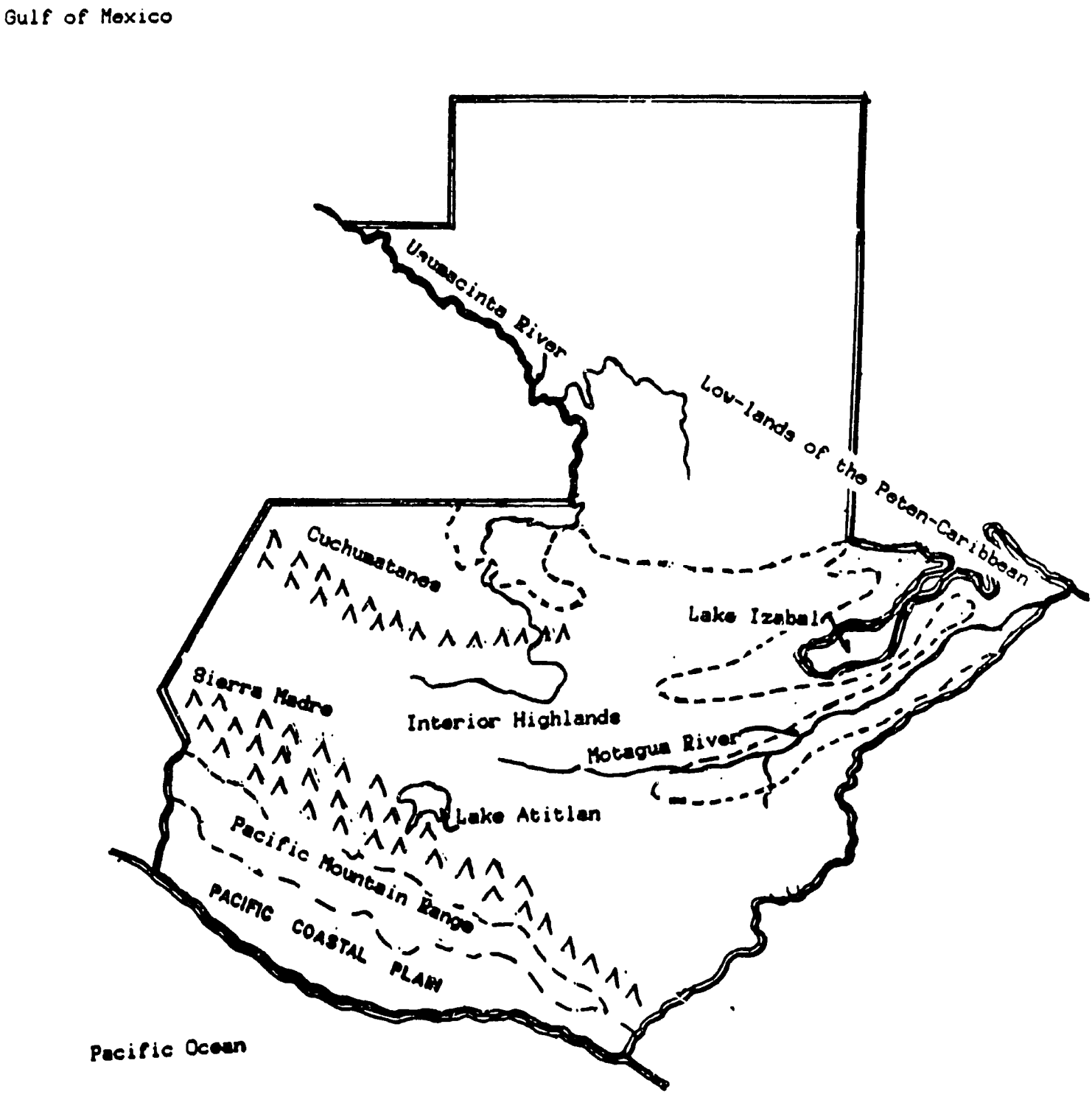

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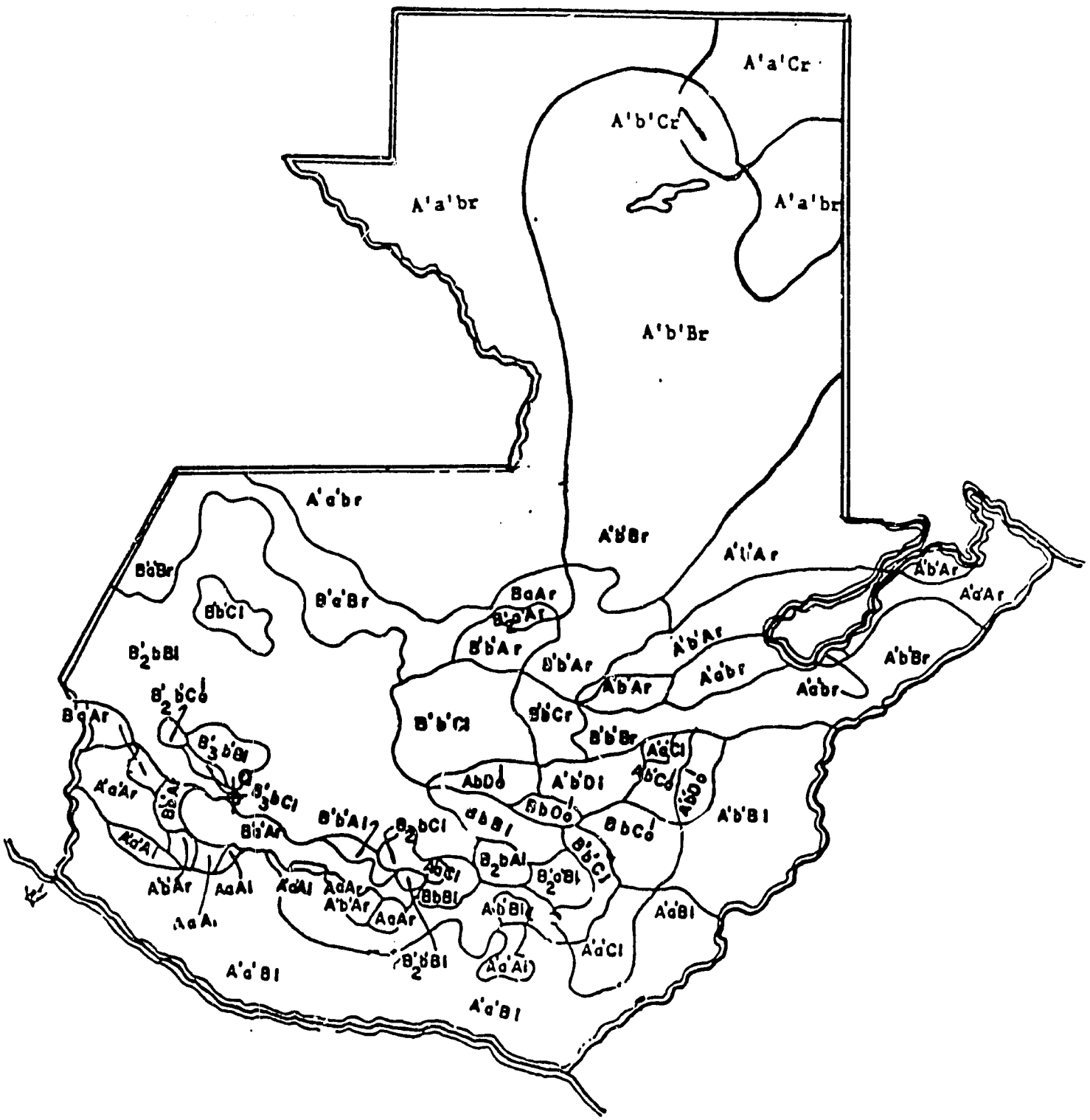
Figure I-G
CLIMATES IN GUATEMALA [1]



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1 Based on the Thornwaite classification system.
See next page for key to codes.

Key to Figure I-C
DEFINITION OF CLIMATE CODES

A'a Br	hot, without well defined cold season, humid, without well defined dry season.
A'a Ar	hot, without well defined cold season, very humid, without well defined dry season.
A'a Ci	hot, without well defined cold season, semidry, with dry season.
A'b'Ar	hot, with benign winter, very humid, without well defined dry season.
A'b'Cio	hot, with benign winter, semidry, with dry winter and dry fall.
A'b'Dio	hot, with benign winter, dry, with dry winter and dry fall.
A'b'Bi	hot, with benign winter, humid, with dry winter.
A'b'Di	hot, with benign winter, dry, with dry winter.
A'a'Bi	hot, without well defined cold season, humid, with dry winter.
A'a'Ai	hot, without well defined cold season, very humid, with dry winter.
A'b'Br	hot, with benigh winter, humid, without well defined dry season.
B'b'Br	semihot, with benign winter, humid, without well defined dry season.
B'b'Cr	semihot, with benign winter, semidry, without well defined dry season.
B'b'Ci	semihot, with benign winter, semidry, with dry winter.
B'b'Bi	semihot, with benign winter, humid, with dry winter.
B'b'Dio	semihot, with benign winter, dry, with dry winter and dry fall.
B'b'Cio	semihot, with benign winter, semidry, with dry winter and dry fall.
B'b'Ai	semihot, with benign winter, very humid, with dry winter.
B12b'Ci	temperate, with benign winter, semidry, with dry winter.
B'a'Ar	semihot, without well defined cold season, very humid, without well defined dry season.
B'b'Br	semihot, without well defined cold season, humid without well defined dry season.
B12b'Ci	semicold, with benign winter, semidry, with dry winter.
B13b'Bi	semicold, with benign winter, humid, with dry winter.
B12b'Bi	temperate, with benign winter, humid, with dry winter.
B12a'Bi	temperate, with well defined cold season, humid with dry winter.
B13b'C	semicold, with benign winter, semidry.
B12b'Cio	temperate, with benign winter, with dry winter and dry fall.

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Figure I-D
AVERAGE ANNUAL RAINFALL (millimeters)

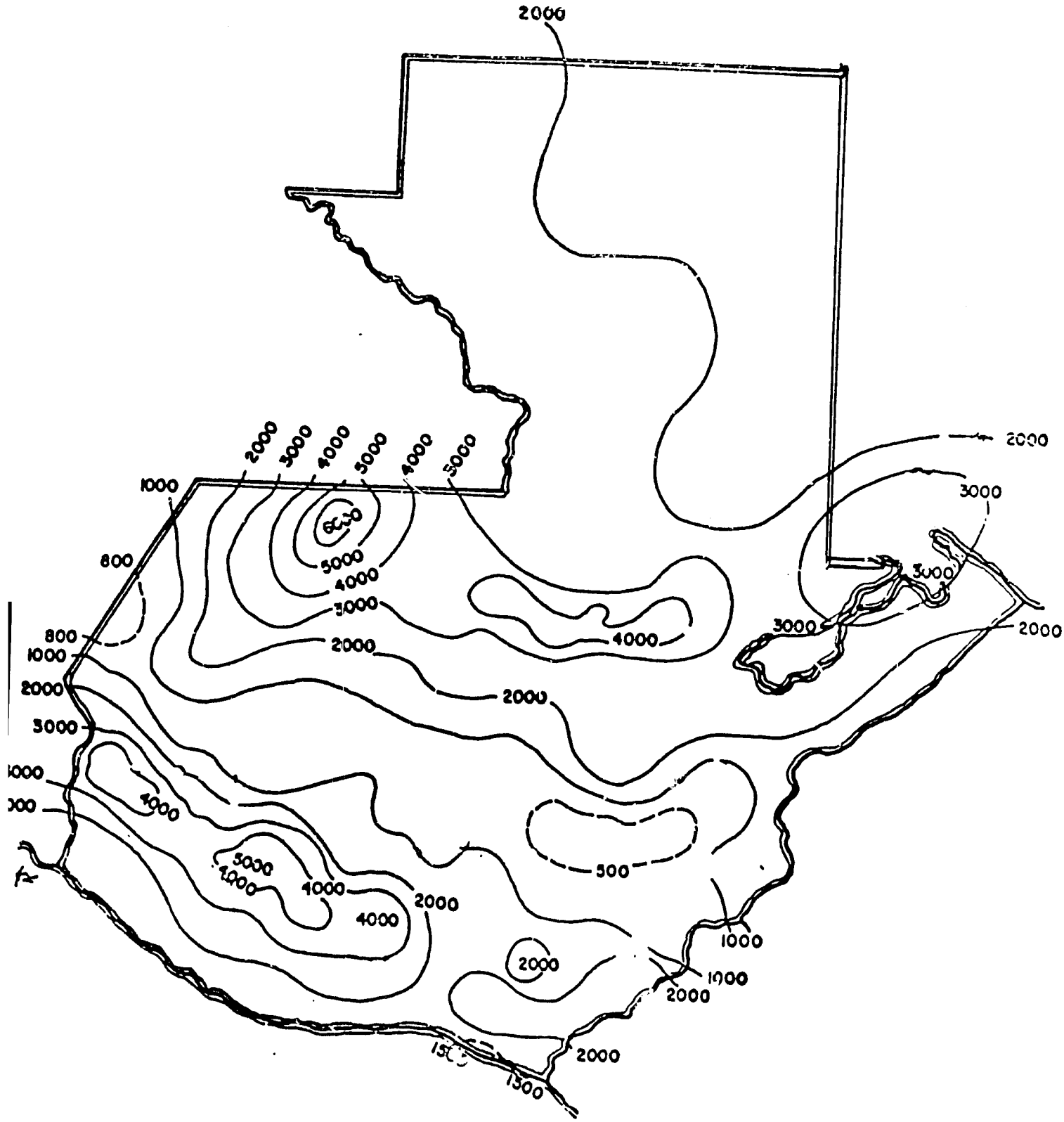

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Figure I-E
ECOLOGICAL ZONES OF GUATEMALA

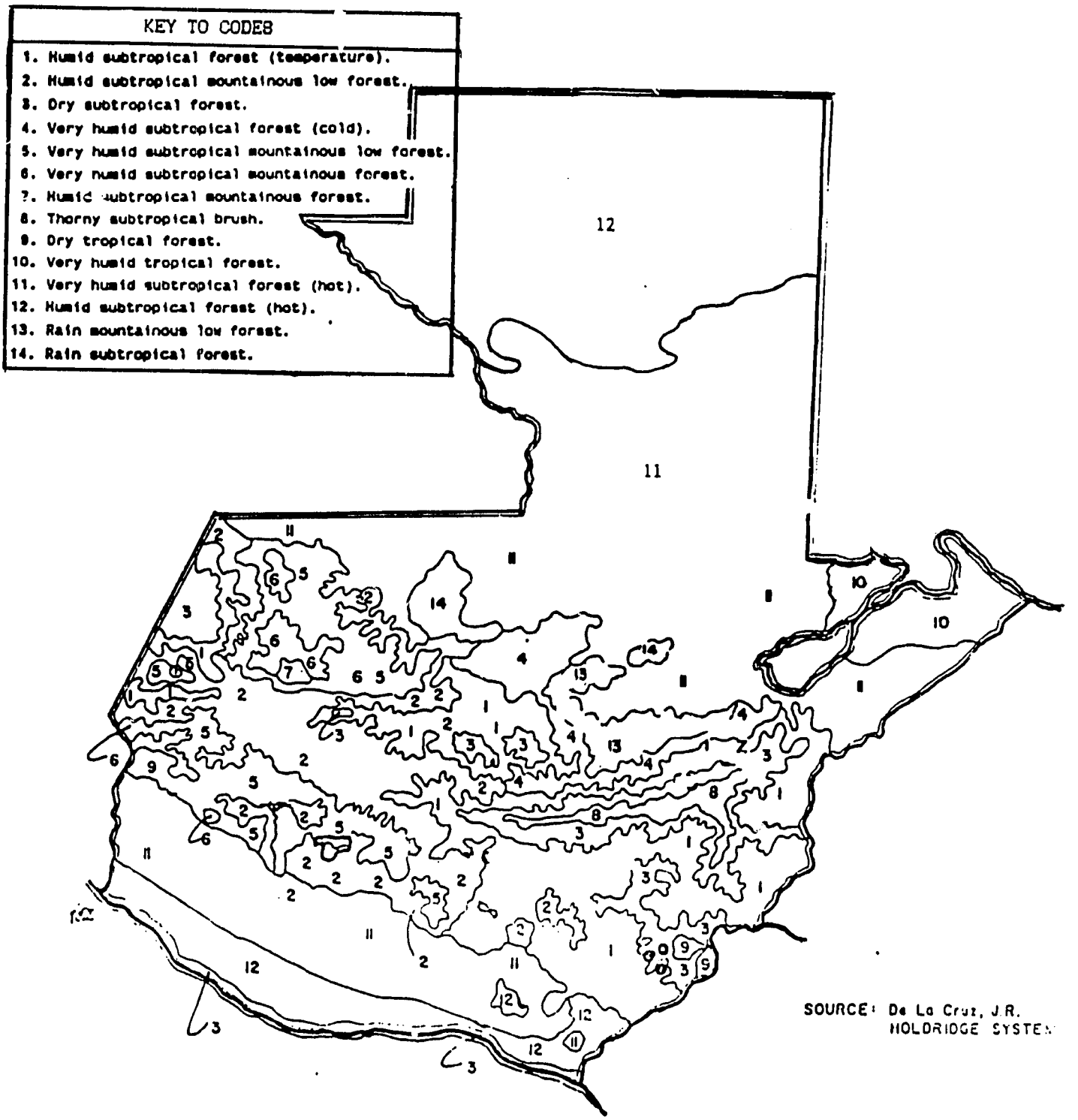

TABLE 1-F

Erosion Susceptibility of Guatemalan Soils

Type of Susceptibility	Surface (km2)	%
None	29,986	28.7
Small	4,801	4.4
Moderate	4,096	3.8
Large or High	35,936	33.0
Very Large or Very High	32,691	30.1

Source: Instituto Geografico Nacional. Atlas de Republica de Guatemala - 1973.

2.0 THE POLICY ENVIRONMENT

In conducting the policy inventory, specific political, economic and social factors were identified by interviewees as significant constraints to forming and implementing long-run strategies for sound natural resource management. Discussion of these factors highlights the theme that poverty and skewed resource distribution are indirectly the fundamental causes of inadequate long run natural resource management practices in Guatemala. *Thus, before individual policies are analyzed, this broader framework of the conditions under which natural resource policies are made and implemented is described.*

2.1 Political Factors

Before analyzing and recommending changes of specific policies which affect the management of Guatemala's natural resources, it is critical to understand the political framework under which such policies are created and implemented. According to interviewees, long run management of Guatemala's natural resources is hampered from a history of political instability, the concentration of political power structure, a centralized decision making process, and the lack of a national development strategy. This section describes these constraints and discusses their relevance to formulating sound natural resource management policies. Specifically, these *political factors contribute to the weakness of the legal and institutional foundations needed to formulate and implement long run natural resource policies and to the lack of political participation of the majority of the population in the entire policy making and implementation process.*

2.1.1 Guatemala's Policy Environment

A Brief History of Guatemala's Political Instability.

Formulating a national development strategy and policies to promote sustainable economic growth are difficult, if not impossible, tasks under conditions of political instability. Guatemala's political history is characterized by military coups d'etat, authoritarian regimes, fraudulent elections, and political violence. Causes of this instability are rooted in the country's social and economic inequities within the society.

The histories of Guatemala's political and economic stability are closely related. Up to the 1950s, Guatemala experienced alternate periods of economic growth and decline, which were closely tied to world economic conditions. The Great Depression of 1929 brought about profound economic and social stagnation and the rebirth of concentrated political power. (Avancso, 1987).

The Reformist Movement of 1945-1954 was formed in reaction to Ubico's dictatorial regime. Its main objective was to establish a democratic political process and to modernize the domestic economy. The Movement implemented significant institutional changes, especially at the political and legal level. The 1945 Constitution promulgated labor and social security legislation and

promoted civil liberties that enabled workers and peasants to participate in the political process. At the economic level, these governments instituted the Agrarian Reform Program, among other national development projects, to modernize the agriculture and industry sectors.

Opponents of the Agrarian Reform Program supported the overthrow of the Arbenz government. Military regimes imposed a number of legal restrictions on society, and social and political organizations were repressed. Political battles within the military resulted in several juntas over the following years. Between 1958 and 1963, during the Ydigoras regime, the guerrilla movement emerged amid deep social discontent, the triumph of the Cuban Revolution, and an uprising of young military officials in 1960. Although no real threat to the military's control, especially under the army's effective counterinsurgency strategy, the guerilla movement was a significant source of instability.

The coups d'etat of 1963 marked the period of unquestionable consolidation of the military's control over economic, political and social spheres of the country (Rosada, 1987). Economic development acquired a relative importance, particularly with the flow of foreign investment and the creation of the Central American Common Market. During this period, the military became increasingly involved in the economy. For instance, in the early 1970s it created the Bank of the Army, took over private companies, bought shares of corporations, and invested in cattle ranches and large landholdings.

Over the 1960-80 period, Guatemala experienced significant economic growth, at an average rate of 5.6% per year. However, this growth did not bring prosperity to the majority of the population. By the mid-70s, the economy showed signs of deterioration under the strain of high energy prices. Foreign capital and technology needed to maintain its rate of economic growth became scarce and expensive.

During this same period, consecutive fraudulent general elections wiped out any remaining sense of legitimacy in government from 1974-1982. The lack of full participation of all groups in society and the disrespect for human rights, combined with the lack of a legitimate civil government that responded to popular demands, fueled the political instability and violence of this period. The military had to develop a more elaborate strategy, combining development and counterinsurgency, in order to control the insurgent forces and isolate them from their support base. In 1983, General Mejia Vitores' government succeeded in its counterinsurgency project, but persistent domestic and international accusations of human rights violations exacerbated the social and political tensions.

The political instability helped produce a severe economic crisis, paralyzing both the private and public sectors. Investment planning time horizons were drastically shortened. The increased risk required that even short-term profits had to be relatively very high to induce even minimal investment. Both short and long-term investments were reduced in number and value. The significant drop in real wages of the lower and middle class translated into a loss of purchasing power and demand. Resources were reallocated for the production of exports and luxury goods. In the public sector, the drop in government revenues curtailed the 1950-1970s trend of large-scale public investment in infrastructure (i.e., ports, electric plants, roads

and bridges).

Under severe political, economic and social pressure, the Army established conditions for democracy. The year 1985 marked the return of democratic rule when Cerezo Arevalo was freely elected president and the country's seventh constitution in 160 years was formed. Although the country is now under civilian rule, memories of civil strife have not receded, and in some parts of the country insurgency and counter-insurgency activities continue. Between March 1982 and November 1983, 15,000 deaths in Guatemala were attributed to political violence (Aguillera, G. 1989). According to data complied by Americas Watch, Amnesty International, the Commission of Human Rights, 19,030 political assassinations and 2,417 persons forcible or permanently disappeared between 1978 and 1986 (Nunez, personal communication 1990). As of March 1989, 40,000 Guatemalan refugees were reported in Mexico and a total of 220,000 Guatemalans are refugees from civil violence ("Republic of Guatemala, Diagnosis, Strategy and Project Proposals, March 1989).

Given these political conditions, it has been difficult for Guatemala to establish a long-run natural resource management strategy and form institutions with the human and capital resources needed to create and implement policies in support of such a strategy.

The Concentration of Political Power in Guatemala.

Special interest groups, including large land and capital owners and military officers, hold most of the economic and political power in Guatemala. History has demonstrated that the power of any government in Guatemala, even if it is freely elected, is significantly constrained by these special interest groups. *The processes of creating and implementing laws and other policies are extremely fragile because political and economic power is held and distributed by a restricted and privileged sector of society.*

An Historical Perspective. The Spanish Crown used pillage and force to achieve power and wealth in its conquest of Guatemala. However, Guatemala lacked the vast mineral resources relative to other countries conquered by the Spanish, so the Spanish took over the most productive lands and enslaved the indigenous population in order to reap economic benefits from their conquest.

The impact of Spanish colonization on the economic and social systems was tremendous. With respect to the economy, it established the bases of land tenure, production and trade relations that would prevail over several centuries. Over time, the Indian population was pushed to the Highlands, whereas the non-Indians occupied the productive lowlands in the south and east. Export-oriented agricultural production led to further concentration of lands in the hands of Spaniards and their descendants. Communal Indian land parcels for subsistence production became scarcer and smaller.

With respect to the social structure, the policy of "Divide and Rule" was central to the maintenance of Spanish authority. Before the conquest, the indigenous population was composed of numerous cultures and each were living in a geographically distinct area. After the invasion, the isolation of Indian communities was encouraged and enforced by the Spanish. After the abolition of

slavery under the New Laws, it became necessary to establish villages to control the mobility of the Indian population and ensure an available labor force. To maintain dominance over the indigenous population, the Spanish divided up the communities, forcing families from various cultures to live together in a community. Today's cultural diversity among the Indian communities, particularly expressed through language and costumes, is mostly a product of this political and administrative organization, rather than of the original ethnic groups. Moreover, some believe that the traditional Indian costumes, still worn today, were designed by the Spanish as easy-to-spot uniforms to identify stray Indians, as well as a tool to promote the development of local as opposed to racial and cultural identities (Martinez, 1974).

Thus, the Ladinos occupied the lands with the most productive soils, while the indigenous population lacked access to resources, wealth, education and political power. At the end of the Spanish domination, there were no substantial modifications to this resource distribution and power structure. This social and economic dichotomy has survived to the present, albeit with diminishing strength and racial purity. (Martinez and Severo, 1970).

From independence to 1985, the Mayan lifestyle was considered an obstacle to the social and economic development of Guatemala. The State maintained an integrated cultural policy with the objective of dissolving the Mayan culture. The new Political Constitution of 1985 marked a significant break from this national policy of assimilation and toward recognition of the cultural diversity of the country. Specifically, under the new law, the State is mandated to recognize, respect and promote the way of life, mores, traditions and forms of social organization of the Indian groups.

Impact on the Distribution of Economic and Political Power.
The consequences of Guatemala's history of concentrated political and economic power is apparent today. For instance, large export enterprises occupy three fourths of the available land. In the agricultural sector, 0.2% of agricultural landholdings make up 36% of the best farmland (Hough, 1982).

Colonization policies continue to benefit the large ladino landowners to the detriment of the campesinos owning small plots of land. Colonization of the area Franja Transversal del Norte (FTN) is an example. Located immediately south of the Peten in the northern departments of Huehuetenango, Quiche, Alta Verapaz and Izabal, this region lacks the natural resources necessary for agricultural production. Nevertheless, the central government instituted a policy of colonization by relocating campesinos who previously lived in the Highlands. This policy further skewed distribution of productive agricultural lands. Without economic or political power, the campesinos have no means to change the distribution of land (Solorzano, 1987).

Another significant special interest group possessing political power in Guatemala is the military. The military throughout history has intervened in Guatemalan politics and economics, often with significant force. For a period of time, it had virtually acquired a monopoly on access to international capital (Torres, 1984). Besides using violence and other means of force, the military has associated itself with the middle and upper class to maintain its political and economic power.

In summary, special interest groups, particularly large landowners and military officers, clearly set the "rules of the game" in the policy arena. For the most part, governments are merely channels for perpetuating their self interests. Any efforts to change policies related to long run management of Guatemala's natural resources which would alter the present ingrained distribution of wealth must take into account these pertinent obstacles.

Centralized Policy Making in Guatemala. Guatemala's centralized government administration, both attracts people looking for jobs (thus increasing urban migration and depleting rural areas of human resources) and tends to separate administrators in the capital from the natural resources they are to manage. A total of 40% of the population lives in major urban centers (Lemmerhoffer, personal communication 1989). Guatemala City itself contains 25% of the population, with 500,000 new migrants per year, 60% of the vehicles and 72% of the industry in the country (Arana, 1989).

Centralization poses at least three major problems to natural resource management and conservation. First, centralized policies may not reflect a complete understanding of the relevant resource, economic, social and cultural constraints to natural resource management and conservation which takes place at the local level. For example, policies designed to protect wildlife or preserve natural forests must take into account the demands of local communities for these resources. Another problem is that rural populations may become increasingly alienated from central natural resource policy objectives, strategies and tactics. Without local support, implementing and enforcing policies become difficult. There are many examples demonstrating the ineffectiveness of centralized policies at the local level: irrigation programs often ignore downstream users; farms and industries are sometimes located on archaeological sites; and lands are cleared for farming in recharge zones of watersheds. The third problem of centralization arises in the implementation stage of policies: migration to urban areas depletes rural areas of professional and technical personnel necessary to implement and enforce natural resource policies and educate the local population.

Recently, the central government has made significant moves to decentralize decision making, particularly in the agricultural and forestry sectors (Tovar; R. Cabrera; Castaneda, personal communications 1989):

- With respect to the forestry sector, DIGEBOS is administratively divided into regions that coincide with the agricultural sector's eight regions.

- Authorities are currently trying to develop an urban and rural development council system to integrate central planning with local inputs and implementation.

- The agricultural sector has been organized into a decentralized planning and management structure that includes:

  - Superior Coordinating Council (COSUCO)
  - Regional Coordinating Councils (COREDAs), one for each of Guatemala's eight agricultural sector regions

- Sub-Regional Coordinating Councils (COSUREDAs)

According to Lemmerhoffer, although the effectiveness of this system fluctuates, it is, in general, not widely accepted and does not constitute a viable development strategy (Lemmerhoffer, personal communication 1989).

- The Municipal Code of October 1989, Decree No. 58-88 of the Congress of Guatemala, sets forth for the first time in environmental legislation, specific roles for the municipal governments (Table 2-A). However, because it lacks a means of enforcement, this code is not very effective in bringing local governments into the decision making process concerning environmental and natural resource issues.

On the other hand, a completely decentralized system for natural resource management also poses problems. Although local authorities may be more knowledgeable or sensitive about how resources can be utilized and distributed in the short term, they may not have the complete picture regarding long-term optimal use levels and distribution for the entire country.

Decentralized natural resource management was identified by some experts as a desirable strategy (Castaneda; R. Cabrera; Tovar, personal communications 1989). However, the degree to which natural resource management and conservation should be centralized depends upon the specific resources and sites in question. The optimal balance of authority at different levels (municipal, regional and national) is case-specific.

Lack of a National Development Strategy. Although the decision making structure in Guatemala is highly centralized, the country lacks a sound national development strategy which is formulated by consensus and ratified by government (Movil; Oliva; Morales, personal communications 1989). *Since the government has no clear global development strategy that reflects a complete understanding of natural resources, it cannot formulate a clear strategy for natural resource management nor develop a commonly shared perception of the trade-offs between resource use and conservation.* For example, a key objective of the proposed "National Plan for Development 1991-1995" is the export promotion of non-traditional crops with high economic value. At the same time, the document refers to the need for public policies that promote the rational and environmentally sound use of the country's natural resources. In Guatemala, these two policy objectives, stated in such general terms, conflict with one another. The production of non-traditional crops, concentrated in the Western Highlands, has placed considerable strain on the area's natural resources because its soils are generally not considered appropriate for intensive agricultural production. Thus, although the central government issues documents such as "Guatemala 2000: Una Estrategia para la Paz y el Desarrollo" and "The National Plan for Development 1991-1995," the contents of these documents do not resolve, or even address, specific critical issues that arise in creating such a strategy.[1]

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[1] SEGEPLAN is attempting to integrate natural resource management issues into the project Apayo a la Planificacion del Disarrollo Regional (GUA-87010-PNUD-SEGEPLAN).

2.1.2 Consequences for Long Run Natural Resource Management Policies

Weaknesses of the Legal and Institutional Foundations for Creating and Implementing Natural Resource Policies. Concentration of political and economic power, political instability, centralized decision making and the lack of a sound national development strategy built by consensus has significant implications for the roles and interactions among public institutions which are directly involved in natural resource management. *The country's legal base, institutional framework and citizen participation in the policy process are too weak to effectively implement policies related to environmental issues.*

Legal Base. The Constitution, the most important law in Guatemala, has several components directly related to natural resource management (Table 2-B). However, its effectiveness in providing the framework for managing the country's natural resources is severely limited by the lack of laws, inappropriate laws and regulations and weak institutions.

Laws and regulations are often outdated because they cannot be effectively applied to current conditions in Guatemala. Table 2-C lists laws in which fines for violations are too low, license systems arcane, environmental impact assessments not required, educational programs not included, and mechanisms for enforcement of the law nonexistent. Many laws also lack the regulations necessary to clarify and implement the underlying policies (Table 2-D). For example, implementation of the National Environmental Law is dependent upon regulations cited in the text that have never been written. Finally, laws are simply lacking for many aspects of the environment (Table 2-D).

Institutional Framework. This legal environment is closely linked to the capacity of government institutions. Institutions mandated to implement policies lack both the credibility and the long-term financing necessary to be effective. The instability of institutions, partially due to changes in personnel (technicians and directors), severely limits the capacity to formulate policies with long-run objectives, such as sustainable management of natural resources. Inadequate staffing, low levels of technical competence, lack of funding, and increasing responsibilities are also causes of the instability. For example, it is estimated that DIGEBOS requires at least twice its existing resources to adequately review and monitor forest management plans and carry out its other required activities (R. Cabrera, personal communication 1989). Moreover, many institutions and programs are dissolved before any long-term gains can be realized. For example, in 1989 CONAP lacked funding for the year and UNEPET's funding was withheld.

The magnified role of the executive branch of government often causes the abandonment of long-term programs and policies in favor of those based on short-term political goals. Official institutions in Guatemala at times serve particular needs (i.e. class, sectoral, international, and personal) rather than collective interests. Thus, pet projects and programs are favored over long-term, institutionalized policies. An example is the current President's program for promoting small scale businesses.

Most administrative structures, plans and activities tend to be approached

from a narrow sectorial perspective. For example, agriculture, education and natural resource management programs are often conceived independent from and at odds with each other. Examples include wells opened in areas that lack electricity to pump the water and agricultural production diversified without concerning the impact on the environment. Recently some irrigation programs have integrated environmental education, reforestation and watershed protection issues into specific projects, such as the Highland Agricultural Development Project (HAD II) (Castaneda, personal communication 1989).

Because intitutions operate from a narrow sectorial perspective, goals among and within institutions are inconsistent, efforts are duplicated, and actions are not coordinated. For example, the Environmental Law mandates CONAMA to protect the air, water, minerals, soils, genetic resources, and noise levels. However, the Health Code mandates the General Director of Health Services to control environmental contamination which adversely affects public health. Without overall development priorities and a national strategy, institutional motivations and objectives become individualized and narrowly focused. Thus, instead of an integrated and coordinated legal system to protect the environment, each institution involved in the environment issues its own individual and often outdated policies.

Moreover, bureaucratic delays result from poor coordination, centralization, the need to justify expenditures, and apathy. Paperwork can take so long that a process may have to be started all over again simply because of a change in the calendar year or change of government (Suarez, personal communication 1989).

Scant Popular Participation in Development Programs. Centralized decision making, erratic actions, and biased political agendas would make any rural population highly skeptical of any official central government programs. However, the case in Guatemala is acute. The skepticism of the Indians, generated from a long history of centralized decision making dominated by Ladinos, broken political promises, and outright exploitation and violations of human rights has translated into apathy and non-participation in the political arena.

The implications for effective natural resource management and conservation efforts at the local level are enormous. The view that the rural Indian population has a "traditional" ability to manage natural resources for survival is somewhat distorted because it ignores issues of resource depletion, long-term sustainable use and the effects of using common property resources. Moreover, Indians do not necessarily believe that natural resources are "sacred"; rather, their attitude is "use and respect" (Nunez, personal communication 1989). Indians are skeptical about natural resource management programs unless their population-specific benefits have been clearly and vividly demonstrated (Nunez, personal communication 1989). Without the support of 55% of the nation's population, most of whom live in rural area, natural resource management and conservation efforts will never succeed in Guatemala. Since 1986, some efforts have been made to include the interests of the rural population through the departmental and regional development councils.

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2.2 Economic Factors

This section covers the distribution and mobility of Guatemala's land, capital and population. The interrelationships among these issues, natural resource problems and Guatemala's pervasive poverty are discussed.

2.2.1 Distribution and Mobility of Land, Capital and Human Resources

Land Holdings and Land Ownership. Most land in Guatemala, excluding the Peten, is privately held (Lambert, personal communication 1989). However, the government owns 22% of the nation's territory (J. Cabrera, personal communication 1989). As in many other Latin American countries, land in Guatemala is very unequally distributed (A.I.D./Development Associates, 1982, Lambert, personal communication 1989). In 1979, Guatemala had one of the highest Gini coefficients[2] of land distribution inequality in Latin America, (85.0), surpassed only by pre-reform Colombia (86.4 in 1964) and pre-reform Peru (93.3 in 1961). This situation has not improved significantly since 1979 (CONATIERRA, 1989).

Large export enterprises occupy 72% of the available land. Of the total agricultural landholdings in the country, 0.2% make up 36% of the land area. Subsistence farms, which support most of Guatemala's rural population, occupy 28% of the landholdings of less than 1 hectare (A.I.D./Development Associates, 1982). Rapid population growth in certain rural areas has forced farming on marginal lands and has added to the problem of deforestation (A.I.D./Development Associates, 1982; Lambert, personal communication 1989).

Very little is known about the large number of tenurial systems in Guatemala. For instance, management methods of indigenous lands range from close community to individual control, but the precise distribution over this range is not known. In addition, many rural small landholders are plagued by insecure land titles. The amount of land registered is twice that which exists in the country, and one half of the land is without title. In the Oriente, land may be held in common by 40 to 50 families (Lambert, personal communication 1989).

Similarly, little is known of land transfers or land rental markets. On the South Coast, large owners rent their land for a year and then require the renter to reestablish the area as pasture (Lambert, personal communication 1989).

The consequences of this pattern of land concentration are exacerbated by the greater skewing of the distribution in the best farmland areas. The coastal departments of Suchitepequez, Izabal and Escuintla have 49% of Guatemala's Class A land. Farms of 450 hectares or larger account for 53%, 49% and 59% percent, respectively, of each department's total farmland, as compared to the 34% national average (MAGA/USPADA, 1989). In sum, the vast majority of farms are very small, while a small number of farms occupy a large proportion of the best farmland.

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[2] The Gini coefficient ranges from a low of zero in a situation of theoretically perfect equality to a high of 100 in a situation of theoretically maximum inequality.

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There are large numbers of landless, adult agricultural workers as well. In 1980, it was estimated that 309,119 landless workers did not hold steady jobs on larger farms (A.I.D./Development Associates, 1982). By 1989, this number had probably grown (CONATIERRA, 1989).

Capital Assets. Landless peasants are too poor to buy land and commercial credit is contingent on extensive assets other than the land property itself (A.I.D./Development Associates, 1982). These structural rigidities, which may also apply to the ownership of forests and estuarine areas, hamper resource mobility.

Rigidities in capital mobility impair efficient resource allocation. Consequently, natural resources are not used optimally across economic activities and across time. Guatemala's Banking Law, past oligopolistic banking practices (banks coordinate their actions through the Guatemalan Bankers Association (Schell, personal communication 1989)) and the sociology of bank ownership (banks are built around specific agricultural, commercial or industrial family interests) has virtually guaranteed the concentration of capital in few hands.

Population. People require services, employment, and access to land and water, all of which place direct and indirect demands on the country's natural resources. Thus, the level, growth and distribution of Guatemala's population are key factors in understanding the country's natural resource problems. In 1989, the estimated population was 8.9 million and the annual growth rate was 2.9%. The population has tripled since 1950. Guatemala's rural population, estimated at 5,133,000 in 1989, is growing at a rate of approximately 2.0%[3] (Lemmerhoffer, personal communication 1989). This implies an additional 102,660 people or 18,665 families every year. Rural population growth contributes to specific resource problems such as deforestation and soil erosion.

The overall population density has risen substantially from 26 habitants/km2 in 1950 to 56/km2 in 1981, and 79/km2 in 1989, making Guatemala one of the most densely populated Central American countries, second only to El Salvador. Moreover, if density is calculated on the basis of cultivated land, the figure soars to 469 persons/km2 in 1989. The distribution of the population is highly skewed: from the highest concentration of 627 inhabitants/km2 in the Department of Guatemala, to 12 inhabitants/km2 in the Peten and Las Verapaces Departments. Recently, the government has developed policies to induce settlement in frontier areas, such as the Peten and the area around Huehuetenango, Coban and the Mexican border.

Rural population growth contributes in some measure to natural resource problems such as deforestation and soil erosion.

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[3] Migration to urban areas absorbs the difference between this growth rate and the national average.

2.2.2 Poverty and its Implications on Formulating Natural Resource Management Policies

The natural resource management and social implications of the distribution and mobility of land, capital and human resources in a country based primarily on agricultural production (25% of GNP and approximately 75% of export revenues come from the agricultural sector ("Memoria de Labores" 1988)) are significant.

Skewed resource and population distributions distort land use patterns[4]. Table 2-E shows the contrast between land use and optimal land use in the departments of Huehuetenango and Quiche. This example is typical of the central and western highlands. Note the over exploitation of agricultural lands and the under utilization of cattle grazing and forest lands. Areas not in use include deforested areas.

In general, lands that have extensive forestry or reserve potential are used for intensive agriculture. This directly causes natural resource management problems:

a) deforestation as peasants destroy forests for agricultural uses and cut down trees for firewood

b) destruction of natural habitats

c) disruption of protected areas, through spontaneous and supervised colonization

d) soil erosion from loss of soil cover in highly susceptible soils

e) poor water management from soil cover destruction in recharge areas.

(Basterrechea, Castaneda personal communications 1989; Martinez 1989).

Conversely, large tracts of land with intensive agriculture potential are used for extensive cattle raising, causing soil compaction and loss of land productivity (Lamport, personal communication 1989).

Restricted access to one of Guatemala's main sources of wealth, its productive lands, directly effects the distribution of wealth in the country. Poverty is pervasive. For many segments of the population, the quality of life in Guatemala is significantly below acceptable levels. Life expectancy is 58.2 years for men and 62.8 years for women (Arana, 1989). Infant mortality is

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[4] Maps of land use and ownership are controlled by the military and some information is not available to the public (Lambert, personal communication 1989).

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estimated at 65 deaths per 1,000. Lack of potable water[5] contributes to a variety of gastro-intestinal problems and is linked to the high infant mortality rate. Malnutrition, especially among children, is widespread. Poverty, as defined by minimum calory consumption requirements established by the Central American Nutrition Institute (INCAP), affected 62% of the population in 1980, 69% in 1985 and 84% in 1988. ASIES estimated that 80% of the population suffered from malnutrition, 83.4% were poor and 64.5% lived in extreme poverty (Lemmerhoffer, personal communication 1989). Public health services are severely limited with only 1.4 doctors per 10,000 people.

Income inequality is also prevalent: the poorest 20% of the population receives only 5% of national income, while the richest 20% receives 54%, according to a 1980 study (Lemmerhoffer, personal communication 1989). The Indian population is generally worse off than the Ladino, as reflected in lower income and quality of life indicators (Nunez, personal communication 1990).

In addition, the skewed resource and population distributions result in both permanent and temporary migration to urban and other agricultural areas. This affects both Indian and non-Indian peasants (A.I.D./Development Associates, 1982) and places a heavy burden on urban public services.

Thus, poverty, resulting from skewed distributions of land and capital assets, is both part of the situation that determines resource use patterns and a result of these practices. An imbalanced land distribution, coupled with increasing population pressure on marginal resources, impoverishes both the population and the natural resource base itself, making it increasingly difficult for the majority of the population to break out of the poverty cycle. *Under these conditions, it is difficult to formulate and implement policies that reconcile the immediate needs of the poor with respect to their demands on the natural resources and the long term objective of preserving a sustainable natural resource base.*

2.3 Social Factors

Ultimately, the management of Guatemala's natural resources takes place at the local level. Thus, *the degree of success in implementing natural resource policies is dependent upon cultural and education characteristics of local populations.*

2.3.1 Cultural Factors

Today, Guatemala has the most diverse indigenous population in Central America. Native Indians comprise nearly 55% of the population, the majority of whom live in the rural areas of the Western Highlands and in the departments of

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[5] Potable water is available to only 45% of the total population and 18% of the rural population and only 33.6% of the population live in communities with access to some type of sewage treatment (Arana, 1989).

Alta and Baja Verapaz. They mainly depend on agriculture, small-scale trade and handicraft manufacturing for their livelihood.

The regionalism of the Indian communities, imposed by the Spanish through forced migration, has remained an obstacle to unification of different ethnic groups. Nowadays, this political division, which does not correspond to the geographic distribution of the ethnic groups in Guatemala, has made it difficult to offer services in native languages.

Among the Indian population of 4 million, 23 Mayan languages and over 300 dialects are spoken (Nunez, personal communication 1989). In some parts of the country, such as Alta and Baja Verapaz, where Kekchi is the dominant language, estimates of monolingualism are as high as 90%. Nationwide, monolingual non-Spanish speakers account for an estimated 50% of the population (Stewart 1984). The distribution of monolingualism is skewed among specific groups, especially women. Of the Indian population aged 15 or older, only 40% are literate in Spanish. This language barrier makes communication, training and education goals of any government program or policy aimed at the adult rural population very difficult to achieve.

Guatemala's two main cultural groups have long-standing antagonisms despite the growing respect for Indian culture. There is a long history of Indian uprisings, the last of which was less than 30 years ago (Martinez 1982). Although the Indian cultures are exposed to the influences of modern Western culture, each responds according to its particular outlook and capacities. The Indians adapt only insofar as necessary to survive, and not without suspicion, skepticism and reluctance (Nunez, personal communication 1989). This provides for a mosaic of cultural attitudes and patterns that affects identity, commonality of goals, personal orientations, and, of course, natural resource management.

Knowledge of Guatemala's cultural realities and their specific programmatic implications will help in the design of natural resource management objectives, strategies and actions that are culturally sensitive and therefore more likely to survive, take hold and succeed at the grassroots level. An acute understanding of Guatemala's cultural diversity is also needed to break the vicious cycle of poverty and poor long run management of natural resources in Guatemala.

2.3.2 Education

Considering that Guatemala's illiteracy rate is 43.5%, and higher in rural areas, *effective education programs are essential to make a significant and long-run improvement in natural resource management and conservation at the local level.* In conducting this inventory, most of those interviewed mentioned two main reasons why education is an important channel for promoting appropriate natural resource management. First, awareness of the consequences of actions helps clarify choices. If policies provide the incentive structure that elicits sustainable use of natural resources, education can go a long way to solve the apparent conflict between development and conservation. Moreover, natural resource use, management and conservation actions are too dispersed across the

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country for a policy to be imposed on a population and then effectively policed. The process of policy making and implementation requires grassroots participation and education to be effective.

Education programs designed to change traditional practices in Guatemala must take into account the cultural diversity across the country including language barriers and the skepticism of rural populations. Several explanations as to why Guatemala's formal education is in general an ineffective tool for changing traditional practices of managing natural resources in rural areas have been cited. Guatemala's educational system suffers from a lack of resources, the inadequate administration of the educational system, from planning to execution, and the waste of scarce resources (Cifuentes, 1984; Magendzo, 1983). According to Cifuentes, the learning and teaching methods are inappropriate because they do not take into account the cultural diversity of the country. The system has historically been organized from the Western cultural perspective and the economic activities, needs and socio-cultural characteristics of more than half the population, mostly located in rural areas, have not been incorporated. In rural areas, the curriculum has little connection to the physical surroundings, especially with respect to immediate practical applications for the work environment. Instead, schooling has a theoretical academic emphasis which obligates students to learn subjects foreign to their culture (Cifuentes, 1984). In addition, low attendance rates in rural areas are attributed to inadequate number and location of schools and the fact that school sessions are scheduled during labor intensive crop planting or harvesting seasons. Thus, a child may have to walk several miles to school in the middle of the corn planting season only to learn about the rivers of Europe. As a consequence, only 31% of children finish the first three years of study, only 19% complete the first six years, and 15% repeat at least one year of school (Arana, 1989).

The educational system needs qualified human and physical resources that meet local socio-economic needs. The Agricultural Technical Schools designed to promote the agricultural education of the country were created within this framework. The programs are designed to respond to the educational needs of the communities, to increase their economic resources and improve their living conditions. Their programs include more relevant subjects, such as crops, irrigation, soil conservation and the installation of potable water systems. Although these schools have not completely succeeded in achieving their goals, the potential for success exits. Environmental and resource management education could become an integral part of these programs.

At the university level, the theme of natural resource management is practically nonexistent. Some exceptions are the University of San Carlos, del Valle and Landivar. The Departments of Biology and Agronomy in San Carlos offer courses and bachelor degrees in natural resources and agricultural production systems. The Center for Urban and Regional Studies in the Department of Agronomy (CEUR) has recently funded a study on the causes for the deterioration of aquaculture resources of Guatemala's lakes ("Deterioro desaparicion de laqos y laqunas en Guatemala." Elgrafico, July 27, 1989). Del Valle's agronomy engineering program and Department of Biology have proposed a three-year technical and five-year licensed degree programs. Landivar with the Institute of Environmental Sciences and Agricultural Technology has both technical and licensed degree programs.

Improvement in education alone will not solve Guatemala's natural resource problems. *Conflicts among objectives related to economic development and natural resource conservation often involve survival needs. Thus, education policies must coincide with policies that promote economic alternatives to activities that involve resource depletion and exhaustion.*

TABLE 2-A

ENVIRONMENTAL COMPONENTS OF GUATEMALA'S MUNICIPAL CODE

Title IV: Government and Administration of the Township

Chapter 1, Article 40 establishes that the township is responsible for the development and promotion of health and environmental sanitation programs.

Chapter 2, Article 56 empowers the township to organize the necessary commissions to implement projects which protect the local environment and cultural heritage.

Title XI: Township Court of Justice Affairs

Chapter 2, Article 136 states that judges of municipal affairs should know about all events that would affect the environment and cultural heritage in their individual district.

TABLE 2-B

ARTICLES OF THE CURRENT CONSTITUTION RELATING TO THE ENVIRONMENT

SUBJECT	ARTICLES
Private Property:	
Guaranteed	39
Expropriation (Based on concrete case)	40
Protection (confiscation of private possessions forbidden)	41
Cultural Heritage:	
Archaeologic & historic possessions of the country under protection of the State.	60
Special Protection of State (Sites declared as World Heritage: Tikal, Quirigua, and Antigua).	61
Natural Heritage:	
In the national interest to conserve, protect and improve natural heritage of country; creating national parks, reserves and refuges.	64
Indigenous Communities:	
Protection of lands and indigenous agricultural cooperatives have special protection from the State.	67
Through special programs and adequate legislation the State will provide government lands to the indigenous populations that need it for their development.	68
Health, Security and Social Assistance:	
Enjoyment of health is a fundamental human right for every citizen, without discrimination.	93
State has obligation to look out for the health and social welfare of all inhabitants.	94
The health of the citizens is a public concern. All persons and institutions are obligated to watch for its conservation and restoration.	95
State must check the quality of foodstuffs, pharmaceuticals, chemical products and any other products that can affect health.	96

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SUBJECT	ARTICLES
State, municipalities and inhabitants have obligation to promote social, economic and technological development that prevents environmental pollution and maintains the ecological balance (most important rule of environmental legislation in accordance with comparative environmental laws)	97
Communities have the right and duty to actively participate in the planning, implementation and evaluation of health programs.	98
The State will watch that the food and nutrition of the citizens meet the required minimum standards for health. The public institutions must coordinate their activities with international health organizations to ensure an effective national food system.	99
Economic and Social Regimen:	
Obligation of State to orient the national economy to utilize the human and natural resources available.	118
Fundamental obligations of the State include: Adopt the necessary measures to efficiently conserve, develop and use natural resources.	119
State property includes: Those of public domain, marine territorial zones, lakes, rivers and their tributaries, any flowing body of water and streams that serve as international boundaries, waterfalls and springs that have hydroelectric potential, subterranean waters and waters not used by private citizens or entities; those defined as national heritage; marine coastal zone, continental shelf and air space defined by Guatemalan law or international treaties; underground resources such as hydrocarbons and minerals; monuments and archeological relics; fiscal and municipal revenue; and radio frequencies.	121

SUBJECT	ARTICLES
State reserves dominion over 3 kilometers of ocean coastal lands, starting from the line of the mean high tide and going inland; 200 meters around lakes; 100 meters on each side of rivers and dikes; 50 meters around springs and flows that support populations with the exceptions of a) property located in urban areas; and b) property whose water rights were registered in the Property Register, before March 1956.	122
Transferring of public property can only be done as established by law, will establish transfer and fiscal limits and requirements.	124
Exploitation of Natural Non-renewable Resources: Declare, it a public necessity and utility, the technical and rational exploitation of hydrocarbons, mines and other natural non-renewable resources.	125
Reforestation: Declared a national priority to reforest the country and conserve forests.	126
Water Regime: All waters are inalienable property of the public domain.	127
Improvement of Waters, Rivers & Lakes: For tourism, agricultural and land and cattle purposes.	128
Electrification: Declared a national priority.	129

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TABLE 2-C

OUTDATED LAWS IN GUATEMALA

YEAR	LAW
1932	Fisheries Law
1948	Animal Health Law
1955	Plant Protection Law
1962	Agrarian Transformation Law
1967	Tourism Law

TABLE 2-D

GAPS IN GUATEMALA'S ENVIRONMENTAL LAWS

REGULATIONS NEEDED FOR CONTROLLING:

1. Forestry Law
2. Protected Areas Law
3. Environmental law
4. Public Health:
   - Waste Disposal
   - Potable Water
5. Municipal Code
6. Hydrocarbon Law
7. Atmospheric Pollution
8. Noise Pollution

LAWS NEEDED:

1. A Water Quality Standards Law
2. An Environmental Impact Assessment Law

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TABLE 2-E

Land Use Potential and Actual Land Use in the Departments of Huehuetenango and Quiche

LAND USE	Agricultural	Cattle	Forests	Other	Total
		(in ha's)			
Potential	321,000	404,300	849,300	2,700	1,577,800
Actual	421,797	132,766	381,498	---	936,061

Source: Ministerio de Agricultura, Ganaderia y Alimentacion, POLITICA FORESTAL: REGION VII NOR-OCCIDENTE 1989-1992, Guatemala, 1989.

3.0 NATURAL RESOURCE POLICY INSTITUTIONS

This chapter describes the role of Guatemala institutions that participate in natural resource policy making and implementation.[1] For each natural resource category (sustainable agriculture, production from natural forests, watershed management and management of wildlands), the main official institutions and their interactions are briefly described using charts.

These four charts highlight the complexity of the institutional environment in a compact format. Along both the vertical and horizontal axes, the names of the main institutions that implement policies related to the particular natural resource issue are listed. In each non-diagonal cell of a chart an "X" appears if there is a formal cooperative relationship between the two respective institutions identified by that cell. A "/" appears if the two institutions cooperate, but only on an informal basis. If the cell is blank, it indicates that both institutions are involved in policies affecting the natural resource issue, but they do not cooperate with each other.

A discussion that highlights the degree of institutional complexity, coordination and cooperation follows each of the charts. This information sets the institutional framework needed to discuss the policy issues presented in Chapters 4 and 5.

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[1] Technical Appendix B in Volume III of this report provides a brief description of over one hundred institutions active in natural resource policy making an implementation. The description includes their institutional characteristics and objectives.

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Chart III-A

INSYITUTIONS' INTERACTIONS CHART
Sustainable Agriculture

PUBLIC	PUBLIC MINISTRY OF AGRICULTURE	- DIGESA	- DIGESEPE	- BANDESA	- ICTA	- INTA	- PROLAC	- Programa MOSCAMED	MINISTRY OF ECONOMY	- CONAPEX/ CONACOEX	MINISTRY OF PUBLIC FINANCE	FYDEP/Liquidating Commission	USAC	PRIVATE	Cooperatives	CONACOMIP/AGMIP	GEXPRONT/BANEX	Gremial de Productores de Agroquimicos	Univ. del Valle	Landivar Univ.	NGO's	REGIONAL/ INTERNATIONAL	CATIE	IICA	CIAT	OIRSA
MINISTRY OF AGRICULTURE	x	x	x	x	x	x	x	x	x	x	x	x			x		x						x	x	x	
- DIGESA	✓	x	x	x			x		✓	✓	✓			x	x		x						x	x	x	
- DIGESEPE	x	x	x	x					✓	✓	✓			x										x		
- BANDESA	✓	✓							✓	✓	✓													x		
- ICTA	✓		✓						✓	✓														x		
- INTA									✓															x		
- PROLAC									/					✓										x		
- Programa MOSCAMED									✓	✓																
MINISTRY OF ECONOMY									✓							x	✓							x		
- CONAPEX/CONACOEX										✓				✓				✓								
MINISTRY OF PUBLIC FINANCE												x														
FYDEP/Liquidating Commission														✓							✓					
USAC																							x	x		
PRIVATE																										
Cooperatives																										
CONACOMIP/AGMIP																	x									
GEXPRONT/BANEX																										
Gremial de Productores de Agroquimicos																										
University del Valle																										
Rafael Landivar University																										
NGO's																										
REGIONAL/INTERNATIONAL																										
CATIE																							x	✓	✓	
IICA																								x	x	
CIAT																									x	
OIRSA																										

3.1 Description of the Principal Institutional Interactions that Affect Sustainable Agriculture

As illustrated in Chart 3-A, public sector institutions maintain relations established by law. Those in the public agricultural sector coordinate their activities within COSUCO and in ministers' councils. Interministerial interactions also take place during the board of directors meetings of various agencies under the control of a ministry. Examples include:

- The National Commission of Exportation and the National Commission of External Commerce is chaired by the Minister and receives representatives of the other ministries, USAC and the guilds/chambers.

- The Ministry of Public Finance, responsible for implementing the fiscal budget through the Technical Directorate of the Fiscal Budget, interacts with central and local government institutions, especially during budget planning/discussion stages.

The University of San Carlos (USAC) has a series of agreements with other government agencies to support agricultural research. There are very few informal relations between the agencies within the Ministry of Agriculture. However, there are several informal relationships between CONAPEX and other agencies within the Ministry of Agriculture. The Ministry of Public Finance also maintains informal ties with CONAPEX and other agencies under the Ministry of Agriculture.

Coordination and or interaction between private sector entities that are involved in agricultural activities is rare. Chart 3-A illustrates no interaction among the most noteworthy private sector groups (which include cooperative associations, universities, and NGOs) and regional institutions active in addressing sustainable agriculture issues. The private sector has both limited formal and informal ties to the Ministries of Agriculture, Finance and Economy.

With respect to agricultural policies, limited interaction exists among the regional and international organizations. In general, IICA acts as an umbrella for the activities being carried out by CATIE and CIAT in Guatemala. Interaction between these organizations occurs in the Agricultural-Livestock Regional Committee (Comite Regional Agropecuario-CORECA). Some joint programs have been developed by IICA and several agencies under the Ministry of Agriculture, and with USAC. CATIE also has ties with these two public sector institutions.

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Chart III-B

INSTITUTIONS' INTERACTIONS CHART

Production from Natural Forests

PUBLIC	PUBLIC MINISTRY OF AGRICULTURE	- DIGEBOS	- USPADA	- DIGESA	- DIGESEPE	- OCREN	MINISTRY OF PUBLIC FINANCE	MINISTRY OF DEFENSE	MINISTRY OF URBAN & RURAL DEVELOPMENT	MINISTRY OF ECONOMY	- CONAPEX/CONACOEX	FYDEP/Liquidating Commission	INTA	MINISTRY OF EDUCATION	MINISTRY OF CULTURE & SPORTS	BANGUAT	ANAM/INFOM	CONAMA/CONAP/SIGAP	INGUAT	INTECAP	USAC	- CECON	- CEMA	MINISTRY OF ENERGY, MINES & HYDROCARBONS	INDE	CORFINA	INACOOP	PRIVATE	Gremial de Madereros	SEYPRONT	AIMPE	CELMOSA	NGO's	CARE	Peace Corps	REGIONAL/INTERNATIONAL	CATIE
MINISTRY OF AGRICULTURE		x	x	x	x		x	x							√		x		x			√			√	√	x	√					√		x	x		x
- DIGEBOS				√		√	√	x					x		√			x	x		√	√	√	√	√	√	x			x		x	√		x	x		x
- USPADA				√	√	√				x																												
- DIGESA																																						
- DIGESEPE						√	√																															
- OCREN																																						
MINISTRY OF PUBLIC FINANCE																																						
MINISTRY OF DEFENSE																									x	x												
MINISTRY OF URBAN & RURAL DEVELOPMENT																																						
MINISTRY OF ECONOMY																																						
- CONAPEX/CONACOEX																x																						
FYDEP/Liquidating Commission																																						
INTA																		x													x							
MINISTRY OF EDUCATION																																						
MINISTRY OF CULTURE & SPORTS																																						
BANGUAT																																						
ANAM/INFOM																																						
CONAMA/CONAP/SIGAP																																						
INGUAT																																						
INTECAP																																						
USAC																																						
- CECON																																						
- CEMA																																						
MINISTRY OF ENERGY, MINES & HYDROCARBONS																																						
INDE																																						
CORFINA																															x							
INACOOP																																						
PRIVATE																																						
Gremial de Madereros																													x									
SEYPRONT																																						
AIMPE																																						
CELMOSA																																						
NGO's																																						
CARE																																		x				
Peace Corps																																					x	
REGIONAL/INTERNATIONAL																																						
CATIE																																						

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3.2 Description of the Principal Institutional Interactions that Affect Production from Natural Forests

Although many institutional activities are significantly, albeit indirectly, related to production from natural forests, only a few institutions have direct impacts. The most important are DIGEBOS, CONAP, FYDEP[2], within the public sector, and the Guild of Lumber Companies from the Chamber of Industry of Guatemala, within the private sector.

Ministry of Agriculture, Livestock and Food. Most interactions within the Ministry of Agriculture on forestry issues are through formal channels. By far, the most important agency under MAGA is the General Directorate for Forestry and Wildlife (DIGEBOS). DIGEBOS is legally responsible for implementing the Forestry Law. However, MAGA sets the tone and direction for the forestry policies that DIGEBOS implements, and MAGA's administrative procedures directly affect DIGEBOS' activities. For instance, DIGEBOS competes with the other institutions within MAGA for financial resources.

At a higher echelon, the relationship between MAGA and the Ministry of Finance with respect to the creation and allocation of the government's annual budget also directly affects the forestry sector. USPADA (the MAGA division responsible for planning and programming projects based on the minister's guidelines and SEGEPLAN's overall development plans) has an adequate number of agronomists, economists, and agricultural economists but only one forestry economist. This imbalance with respect to human resources at the sectoral planning level can help explain the relatively low attention within MAGA on the forestry sector.

Thus, the historical emphasis within MAGA has been on agricultural activities, with few resources devoted to forestry. However, a strong private and public sector interest in the development of forest production has recently developed. With massive reforestation programs and the Forestry Action Plan for Guatemala (part of FAO's worldwide Tropical Forestry Action Plan) underway, political conditions are increasingly favorable for the financial and technical support of DIGEBOS within MAGA.

As illustrated in the first row of Chart 3-6, MAGA also interacts with other institutions. The most noteworthy are:

- The Ministry of Defense.
  Coordination and cooperation for implementing reforestation projects.

- The Ministry of Education.
  The School of Agricultural Science is relatively dependent on MAGA, and offers a technical vocational degree program in forestry. Some coordination exists.

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[2] A Commission is in the process of liquidating FYDEP.

- The Bank of Guatemala.
  The exportation of forestry products.

- CONAMA/CONAP.
  DIGEBOS is an institutional member of CONAP.

- USAC.
  Various agreements of cooperation exist for training professionals, especially in agricultural science. If implemented well, these could have a positive impact on the forestry sector.

- Ministry of Energy, Mines and Hydrocarbons.
  Reforestation projects for firewood production.

- INDE.
  Watershed management projects that have reforestation and forest management components.

- CORFINA.
  Projects financed by COPFINA that involve forest production and management (i.e. CELGUSA and the reforestation project for northeast Guatemala).

- CELMOSA.
  Pulp production projects through DIGEBOS and CORFINA.

- CARE and Peace Corps.
  Reforestation and conservation of soils through DIGEBOS.

General Directorate of Forests and Wildlife. The principal relationships between DIGEBOS and other institutions, both public and private, are based on application of the Forestry Law. Important informal interactions have developed with NGOs that are involved in agroforestry projects.

Application of the Forestry Law in protected areas, especially in buffer zones, control of non-wood forest products (such as "chicle," "chipe," and "shate") and evaluation of the environmental impact of forest production projects are the principal points of conflict in the recent interactions between DIGEBOS, CONAMA and CONAP. In addition, DIGEBOS is an institutional member of CONAP and administers some conservation areas of SIGAP.

Before the new Forestry Law was inacted, DIGEBOS in cooperation with local governments, determined the level of a municipal tax base on volume of forest production. The new law limits this institutional relationship to control and promotion of
forest management in municipal forests and municipal control of tree cutting in urban areas.

The institutional relationships of DIGEBOS with CARE and the Peace Corps occur mainly in the form of cooperation to execute social agroforestry projects. DIGEBOS and the Guild of Lumber Companies participated in the development of the

Forestry Law's regulations that were presented March 21, 1990, as established by Article 104. Traditionally the relationship between the public and the private sector has been hostile. Neither sector understood or agreed on the application criteria of the forest production and management regulations. Straightforward regulations and stronger institutional technical capacity are keys to reaching a clear long-term understanding between the sectors.

DIGEBOS also interacts with other government institutions on other issues. Within MAGA, DIGEBOS interacts with USPADA because of its sectoral planning and coordination function. Formal interaction with DIGESA occurs within COREDA and COSUREDA and informally in the field, where projects are being implemented in the same areas or involving similar activities. For example, DIGEBOS operates projects that include soil conservation and overlaps with DIGESA's activities in this area.

DIGEBOS interacts with the Ministry of Public Finance in the assignment of funds and the execution of the budget. Even though formal relationships with this ministry normally occur at the highest levels of MAGA or through USPADA, there are also direct relationships with DIGEBOS.

Interactions of DIGEBOS with the Ministry of National Defense, the Ministry of Energy, Mines and Hydrocarbons and INDE occur in the execution of forest development projects, especially in reforestation.

Interactions between DIGEBOS and OCREN or INTA are related to the control of forest management and use in national reserve areas. OCREN's responsibilities for the Reserve Areas Law will overlap with DIGEBOS' responsibilities for the Forestry Law when reserve areas are also specified conservation areas within the Forestry Law. This will be especially true for mangrove areas. Cooperation will be required on management plans and inventory of lands and uses in reserved areas. Transfer of national land to colonists frequently involve policy conflicts between INTA and DIGEBOS. INTA promotes agricultural projects on lands that have forest cover without considering the forest protection or production policies of DIGEBOS. The new Forestry Law clearly defines this relationship, stating that it is DIGEBOS' responsibility to determine the potential soil use in proposed colonization areas with forest cover.

DIGEBOS' interactions with USAC and INTECAP, which have just begun, include some intermediate training courses with INTECAP, planning of forest education projects and development of specific activities. Closer interaction with respect to training and research and additional ties to other universities are needed. DIGEBOS' interactions with USAC occurs through its management of forests in areas immediately around "biotopos" managed by CECON and its control over forest harvesting in coastal areas of interest to CEMA.

CORFINA administers funds for the Northeast Reforestation Project through low interest and/or long-term loans. This project, related to the wood pulp supply requirements needed for CELMOSA, is carried out by DIGEBOS and private companies. CORFINA's bureaucratic requirements, unilateral change of the "rules of the game" and payment delays have hindered DIGEBOS in complying with established goals.

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Other Relationships. Other relationships between DIGEBOS and other institutions include:

- o forest management and developing forests as firewood sources, with CATIE;
- o control of non-wood and forest production in the Peten when concessions are granted with CONAP, DIGEBOS and Comision Liquidadora FYDEP; and
- o application of exportation procedures and policies for forest products with AIMPE, the Guild of Lumber Companies, GEXPRONT, BANGUAT, and the Ministry of Economy.

Chart III-C

INSTITUTIONS' INTERACTIONS CHART

Watershed Management

PUBLIC	PUBLIC MINISTRY OF ENERGY, MINES & HYDROCARBONS	- Dir. of New & Renewable Energy Sources	MINISTRY OF AGRICULTURE	- DIGESA/DIRYA	- DIGEBOS	- USPADA	- OCREN	- INTA	- ICTA	- GACILA	MINISTRY OF COMM., TRANS. & PUBLIC WORKS	- CAMINOS	- INSIVUMEH	- Executing Unit of Xaya-Pixcaya	MINISTRY OF URBAN & RURAL DEVELOP.	MINISTRY OF DEFENSE	- IGM	INDE	SEGPLAN	INFOM	CONAMA	UNEPAR	EMPAGUA	USAC	- Faculty of Agronomy	- CECON	NGO's	CARE	REGIONAL/ INTERNATIONAL	CATIE	FAO	PNUD
MINSTRY OF ENERGY, MINES & HYDROCARBONS	x		x								x				x	x		x														
- Dir. of New & Renewable Energy Sources				✓	x										✓		✓	x										✓		✓	✓	
MINISTRY OF AGRICULTURE				x	x	x	x	x	x		x				x	x		x									x			x	x	x
- DIGESA/DIRYA					x	x		✓	x				✓		x		✓	✓										x		✓		
- DIGEBOS						x	✓	✓							x		✓	x										x		x	✓	✓
- USPADA									✓						x															✓	✓	✓
- OCREN																		✓														
- INTA												✓			✓	✓		✓														
- ICTA													✓				✓													✓	✓	✓
- GACILA																																
MINISTRY OF COMMUN., TRANSPORTATION & PUBLIC WORKS															x	x		x														
- CAMINOS													✓		✓	✓		✓														
- INSIVUMEH																		x												✓		
- Executing Unit of Xaya-Pixcaya National Aqueduct																																
MINISTRY OF URBAN & RURAL DEVELOPMENT																x		✓		x		✓					✓					
MINISTRY OF DEFENSE																		x														
- IGM																		✓												✓		
INDE																														✓		
SEGPLAN																																
INFOM																																
CONAMA																																
UNEPAR																																
EMPAGUA																																
USAC																																
- Faculty of Agronomy																																
- CECON																																
NGO's																																
CARE																														✓	✓	✓
REGIONAL/INTERNATIONAL																																
CATIE																																
FAO																																
PNUD																																

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3.3 Description of the Principal Institutional Interactions that Affect Watershed Management

Chart 3-C illustrates the interrelationships among institutions dealing with water resources.

Based on a definition of watershed management as the rational use of water, soil, forestry and wildland resources, there are numerous institutions that are involved in the field through studying, regulating and controlling activities and developing projects. CATIE (1987) has found that approximately 33 institutions conduct activities that affect watershed management.

In Guatemala all waters are in the public domain. Nevertheless, no law exists that regulates the water resource. The only government office authorized to control water use is the Technical Directorate of Irrigation and Drainage (DIRYA) which is responsible for issuing permits for water use. Nevertheless, its regulatory capabilities are limited and concentrated mainly on irrigation. As a result of this and the lack of a water law, the municipalities control the resource for water supply and the INDE controls it for hydroelectricity.

DIRYA is responsible for regulating water use and studies and constructing some irrigation projects that are later operated by DIGESA. However, almost 88% of the irrigated lands are under the control of private consortia that operate almost without governmental regulation. "In the last few years DIGESA has been doing studies and executing small irrigation projects without the direct participation of DIRYA." (Basterrechea, personal communication 1990).

Water use for hydroelectricity is characterized primarily as a governmental monopoly through INDE (Braceli, 1985). As a result, INDE has not promoted closer and/or formal relationships with other institutions. For example, INDE has executed reforestation and soil conservation projects that, based on institutional structure and policy mandates, should be the responsibility of DIGEBOS and DIRYA, respectively. Not until recently has INDE been required to interact with other institutions in developing the feasibility studies for the Management Plan Project of the High Part of the Chixoy Watershed.

Many institutions are involved with providing drinking water and sewer services: public institutions directly dependent on the presidency, five ministries, public autonomous institutions, private companies and NGOs. As a result, it might be concluded that these services reach a high proportion of the population, but this is not the case. Coverage for drinking water is under 50% and for sewer services, 33%. To improve coverage, the Comite Permanente de Coordinacion de Abastecimiento de Agua Potable y Saneamiento-COPECAS (Permanent Coordinating Committee for Drinking Water Supply and Sewer Services-COPECAS) was created. Its members include SEGEPLAN, EMPAGUA, INFOM, UNEPAR, the Division of Environmental Cleaning, the USAC Regional School of Sanitation Engineering, and the Pan American Health Organization.

Despite the minimal coordination among the institutions that provide drinking water and sewer services through COPECAS, there is some division of responsibility, with drinking water service provided to Guatemala City and vicinity by EMPAGUA, to the municipal seats by INFOM and to the towns and

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villages by UNEPAR. Sewer service to municipalities and towns is provided by INFOM and the Division of Environmental Cleaning. There are numerous other government agencies (Directorate of Community Development, Drinking Water Program of the Army, Ministry of Urban and Rural Development) and non-governmental organizations (Water for the People, Berhost) that provide drinking water and sewer services, but they have different methods for beneficiaries to participate in the projects. In addition, they develop activities that do not meet the objectives initially established and their priorities and project evaluating criteria for projects often conflict with each other (Basterrechea, personal communication 1990).

All the basic units needed to manage watersheds exist within the administrative structure of the Guatemalan government. Under CONAMA, the recently created National Advisory Commission for Watershed Management (CONAMCUEN) has taken on coordinating responsibilities. For instance, CONAMCUEN has developed the management plan for the Xaya-Pixcaya sub-watersheds with the assistance of CATIE. This has strengthened the institutional relationships of CONAMCUEN's member institutions. In addition, the Ministry of Urban and Rural Development has developed a management plan for the Atitlan watershed. During the development of this plan activities were coordinated with institutions that work in the area.

Nevertheless, CONAMCUEN is only a consulting entity and lacks the capacity to carry out the functions mentioned above. These functions should be assigned to a ministry or institution that has the financial and human resources needed and that can guarantee the coordinated execution of policies.

In conclusion, Guatemala has a large number of institutions and organizations involved in watershed management and control. However, they operate without inter-institutional cooperation, each one following individual interests. As a result, there is widespread duplication of effort and inefficient use of human, financial and physical resources.

Chart III-D

INSTITUTIONS' INTERACTIONS CHART
Management of Wildlands

PUBLIC	PUBLIC MINISTRY OF AGRICULTURE	- DIGEBUS	- INIA	- DIGESIFE/ DITEPESLA	- BANDESA	CONAMA/CONAP	USAC	- CECON	MINISTRY OF CULTURE & SPORTS	- IDAEH	MINISTRY OF ENERGY, MINES & HYDROCARBONS	PRIVATE	AIMPE	Univ. del Valle	Univ. Landivar	NGO's	Assoc. Amigos del bosque	Assoc. Guat. de Historia Nat.	Defensores de la Naturaleza	Asoc. de Orquideología	Sociedad Audubon de Guatemala	Peace Corps	Others	REGIONAL/ INTERNATIONAL	CATIE	UICN	Central American Environmental Commission
MINISTRY OF AGRICULTURE	x	x	x	x	x																						
- DIGEBOS		x				x	✓	✓					✓				✓	✓									
- INTA					x	x																					
- DIGESEPE/DITEPESCA					x	✓	✓																				
- BANDESA																											
CONAMA/CONAP							✓	x		✓			✓				✓	✓	✓	✓	✓	✓		✓			
USAC								x						x	x			✓						x			
- CECON										x				✓			✓	✓	✓	✓	✓	✓		✓			
MINISTRY OF CULTURE SPORTS																											
-IDAEH																											
MINISTRY OF ENERGY MINES & HYDROCARBONS																											
PRIVATE																											
AIMPE																											
University del Valle															✓									x			
Rafael Landivar University																								x			
NGO's																											
Association Friends of the Forest																											
Guatemalan Association of Natural History																											
Defenders of Nature Foundation																											
Guatemalan Orquid Association																											
Audubon Society of Guatemala																											
Peace Corps																											
Others																											
REGIONAL/INTERNATIONAL																											
CATIE																											
UICN																											
Central American Environmental Commission																											

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3.4 Description of the Principal Institutional Interactions that Affect Management of Wildlands

The principal institutions involved in the application of policies that affect the management of wildlands include CONAP, DIGEBOS and CONAMA. In addition, SIGAP, CECON and IDAEH administer several protected areas. The principal interactions identified are illustrated in Chart 3-D.

CONAP is legally responsible for implementing and enforcing the Protected Areas Law. Two distinctive formal interactions between CONAP and its institutional members exist: between the institutions themselves and between the institutions and the executive secretary of CONAP.

CONAP's relationships are particularly strong with CONAMA and DIGEBOS which have been granted other legal mandates to conserve wildlife.

CONAMA plays a dominant role within CONAP because of the following reasons:

- The coordinator of CONAMA is also the president of CONAP.
- The coordinator of CONAMA proposes a nominee for the executive secretary of CONAP to the President of Guatemala.

DIGEBOS, in addition to its role as an institutional member has several potential channels for coordination with the executive secretary of CONAP:

- Currently discussions are underway on the roles of both institutions in relation to forest wildlife, especially in relation to non-wood forest products such as latex, resin and non-firewood plants.

- The Forestry Law states that DIGEBOS is responsible for protecting endangered trees and forest ecosystems. This overlaps with CONAP's mandate. Therefore, both institutions must reach a clear understanding on their role in these activities.

- Forest management, especially in buffer zones, will require coordinating activities of both institutions, as DIGEBOS regulates forest management and CONAP protects wildlife and biodiversity.

Cooperation between the two institutions is vital because of adjacent land issues, unclear areas of responsibility and the institutional limitations and weaknesses of both. Some aspects of the Forestry Law may give DIGEBOS regulatory authority over some functions in protected areas, such as pesticide application and burning. Since CONAP has no technical capacity to implement the Protected Areas Law, some cooperation with DIGEBOS is anticipated.

Other Important Interactions between CONAP, CONAMA and other institutions include:

- o <u>Fishing policies of DITEPESCA</u>.
  Institutional cooperation in creating long-run sustainable marine resource production policies is weak.

- o <u>The colonization policies of INTA</u>.
  In practice, these policies have not considered the need for sustained resource utilization and the impact on ecosystems, wildlife and biodiversity. The progress of CONAP, CONAMA and DIGEBOS in applying their respective laws will imply the revision of INTA's policies and policies of other institutions such as CONATIERRA involved in agricultural land use.

- o <u>Mineral and hydrocarbon exploitation policies of the Ministry of Energy, Mines and Hydrocarbons</u>.
  These policies are not completely compatible with the relatively new environmental policies that include conservation of wildlife. The conflicts that surfaced in 1989 between CONAP-CONAMA and the Ministry of Energy, Mines and Hydrocarbons over hydrocarbon exploitation activities in the Peten clearly illustrate the lack of policy integration at the national level.

- o <u>Protected areas policies of NGOs and universities</u>.
  Interactions occur through cooperation on joint projects, research and development of protected areas.

In addition, informal interactions involving CONAMA, CONAP and DIGEBOS have been established with private organizations, such as the Guild of Forest Producers and the Association of Wood Industrialists from the Peten (AIMPE).

3.5 Institutional Coordination Across Natural Resource Policy Issues

The inventory did not identify, at any level, a government entity which effectively coordinates the definition and execution of development policies, objectives, priorities and strategies for the integrated management of water, soil and forest resources. CONAMA, created in 1986, is mandated to coordinate activities concerning the protection of the environment, while SEGEPLAN issues general guidelines and objectives for economic development and environmental protection. However, there is no precise strategy for coordinating and implementing these national plans ("Plan Nacional de Desarrollo 1987-1991" and "Presidencia de la Republica: Guatemala 2000: Una Estrategia para la Paz y el Desarrollo."). On a regional scale, MAGA will implement an institutional integration model at the field level in the Highlands Agricultural Development Project. This regional project includes joint activities in watershed management, diversified agricultural production, small-scale irrigation, commercialization and agroforestry and livestock systems within small-scale irrigation units. The institutions participating in this project are DIGESA, DIGEBOS, INDECA, BANDESA, ICTA and DIGESEPE.

The institutional infrastructure to support coordinating efforts in the policy arena can be classified in two groups: those that execute support studies and those that use the information generated by the first group. Of the institutions qualified to carry out soil, water and forest studies, the most important are: DIRYA, DIGEBOS, IGM, INDE, INSIVUMEH, GACILA, IIA, the USAC Faculty of Agronomy, CECON and ERIS and the School of Agricultural Sciences in the Rafael Landivar University. The existing natural resource studies are focused on solving specific problems including deforestation, soil erosion, water use and use of other resources. Nevertheless, these are conducted independent of each other and do not address integrated management of natural resources.

One important mechanism to harmonize national economic development and natural resource policies is through the enforcement of the Environmental Law, which requires Environmental Impact Assessments for development projects. Institutional channels for coordinating the implementation of scientifically based EIAs must be developed and systematically executed.

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4.0 DISCUSSION AND EVALUATION OF SIGNIFICANT NATURAL RESOURCE POLICIES

This chapter is divided into three sections. The first explores the role of Central American regional policies and international agreements affecting Guatemala's natural resources. The second analyzes Guatemala's macroeconomic policies, particularly recent reforms as they relate to the country's natural resource base. Finally, Policy Inventory Tables for sector and subsector policies are summarized.

4.1 Regional Policies and International Agreements

4.1.1 Central American Regional Policies

Addressing many of Guatemala's natural resource issues, such as watershed management, coastal zone management, sustainable yields of marine life, and protection of natural forests and wildlife requires policy coordination with other Central American countries.

The newest and most innovative approach to addressing environmental issues on a regional basis is the Central American Commission on the Environment and Development (CCAD). This commission will be composed of five senior advisors, with the presidents of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua each appointing one advisor.[1]

CCAD will serve as a means for the presidents to address and solve regional environmental problems and to develop sound strategies for the use of natural resources and action plans that promote sustainable development for the region. Under the presidents' direction, CCAD is mandated to conduct investigations and make recommendations concerning environmental issues. CCAD's main functions and objectives are focused on environmental education, protection and management of shared watersheds and ecosystems, management of tropical forests, and control of environmental contamination.

At the last preliminary CCAD meeting held in San Jose, Costa Rica, on January 19, 1990, the participants agreed on the following actions:

1. To expedite formal approval of the commission by each country.

2. To obtain sources of financial support for the commission.

3. To compile and examine international laws and domestic laws of the member countries concerning the environment and sustainable development in order to strengthen the legal basis for CCAD.

4. To develop a regional strategy and corresponding plan of action for the sustainable use of the natural resources and improve the quality

[1]Recently, Panama and Belize have been invited to participate in the CCAD.

of life for the people of Central America.

5. To organize a seminar to be held in Honduras in April 1990 on the potential for debt for nature swaps in Central America. Lessons learned from the Costa Rica experiences will be emphasized.

Another effort to coordinate policies affecting natural resources on a regional basis is CIECA (Secretariat of the Central American Integrated Economy). Agricultural ministers from Central America have met and signed agreements to coordinate and support government efforts in conservation and public education on environmental issues through this organization (Ruiz, personal communication 1990). Also, Plan Trifinio, ratified by the Vice Presidents of El Salvador, Guatemala and Honduras on November 12, 1989, is a ten-year $878 million development project with important environmental components ("Aprobado presupuesto para 1990." Inforpress Centroamericana, December 21, 1989).

In addition, several government and international institutions working in Guatemala, such as USAID, the European Community, World Bank, and IMF, issue policies concerning management of the country's natural resources ("La Comunidad Europea ayudara a proteqer los bosques tropicales." Elgrafico, August 14, 1989). Examples include the Bank of Central America, which incorporates environmental issues into its credit policies, and the European Community, whose funding for road construction was recently withheld until plans to build a refinery in the Peten were halted (Ruiz, personal communication 1990).

Guatemala has also signed over twenty regional and international treaties and agreements (Table 4-A). However, implementation of these agreements are often lacking or weak. Further efforts are needed to integrate and coordinate policies concerning the management of natural resources in Central America. The regional policy inventory, which will be conducted after these individual country inventories are completed, will address these avenues for policy integration and coordination more rigorously.

TABLE 4-A

REGIONAL AND INTERNATIONAL TREATIES AND AGREEMENTS
(The date that the agreement took effect or was ratified by the Government of Guatemala appears in parentheses)

International Treaties

1. Treaty that prohibits nuclear arms testing in the atmosphere, space, and water. (January 6, 1964)

2. Treaty to prevent sea contamination from dumping of wastes and other matters. (August 30, 1975)

3. Treaty on the civil responsibility for damages caused by sea contamination from hydrocarbons. (September 27, 1976)

4. Amendments to the treaty of 1954 on the prevention of sea contamination by hydrocarbons, relating to oil tankers and their capacity limitations. (August 21, 1980)

International Agreements

1. Agreement to protect wildlife and the natural scenic beauty of the Americas. Special attention is given to migratory bird species. (May 1, 1942)

2. Agreement on the Continental Shelf. (June 10, 1964)

3. Agreement on the prohibition of development, production and storage of biological and toxic weapons and on their destruction. (March 26, 1975)

4. Agreement to protect the cultural and natural heritage of the world. (April 16, 1979)

5. Agreement to protect the archaeologic, historic and artistic heritage of the Americas. (December 17, 1979)

6. Convention on International Trade in Endangered Species of Fauna and Flora (CITES). (February 5, 1980)

7. Agreement on plant health protection. (August 21, 1980)

8. United Nations agreement on marine rights. (signed July 8, 1983, although the effective implementation date for this agreement has not been set)

9. The "Trifinio" Biosphere Reserve - Municipal jurisdiction of Esquipulas and Concepcion Las Minas in the Department of Chiquimula. This is an agreement for technical cooperation among Guatemala, El Salvador, Honduras, the Organization of American States and IICA. (October 27, 1987)

10. Agreement on wetlands of international importance, especially as a habitat for aquatic birds. (April 5, 1988)

11. Vienna agreement to protect the ozone layer of the atmosphere. (May 9, 1988)

12. Agreement to assist in case of a nuclear accident or other radioactive emergency. (June 6, 1988)

13. Agreement between the governments of Guatemala and Mexico to protect and improve the environment along their common border. (June 15, 1988)

14. Agreement to notify countries of a nuclear accident. (July 6, 1988)

15. Agreement for the governments of Guatemala and West Germany to exchange information on an environmental protection project in the treatment of water residuals and wastes. (December 30, 1988)

16. Agreement to protect the marine environment of the Caribbean Basin. (May 30, 1989)

International Protocols

1. Protocol of cooperation to combat hydrocarbon spills in the Caribbean Basin region. (July 5, 1983)

4.2 Macroeconomic Policies in Guatemala

This section describes Guatemala's broad development strategy and macroeconomic policies. The policy effects on the long run management of the country's natural resources is briefly discussed. Subsequent RENARM policy analysis should focus on these relationships highlighted in this inventory.

4.2.1 Guatemala's Development Strategy

Guatemala's past import-substitution macro policies dampened the demand for resources in the agricultural sector. By artificially raising the rate of return on investment in the industry sector, underinvestment in the poor rural areas was induced, and surpluses originating in agriculture were re-allocated to capital formation in manufacturing. Guatemala's current export-led growth strategy is more in line with its comparative advantage on international markets. However, today's export promotion strategy, in particular the promotion of non-traditional crops, and tax incentives to decentralize away from urban areas has exerted pressures on land and water resources. *Sound natural resource management policies need to be integrated into this export-led growth strategy in order to ensure long-run sustainable growth.*

4.2.2 Monetary Policies

Interest Rates. Recently, restrictions on interest rates were lifted. Previously, loan rates had been fixed at 16 percent and deposits at 13 percent. Reserve requirements for banks are 46 percent for checking accounts and 13 percent for other accounts. In the short-run, the impact of these changes was minimal, largely due to the oligopolistic nature of the banking sector. A rise in interest rates will have a positive effect on investment, as the real rate of return becomes positive. The effect on the natural resource base will depend on in which sectors investment occurs.

Credit Availability. There is evidence of credit constraints in Guatemala. First, the lack of laws regulating international banking activities discourages foreign banks from operating in Guatemala. Second, Domestic Bank's collateral requirements for loans are very strict. Banking laws require a maximum of 50% of the assessed value of property for a loan of up to 20 years; a maximum of 70% of value of capital (i.e. machinery, cattle) for up to 5 years; and no collateral for personal loans of up to one year. Banks typically assess real estate at half its value and grant loans almost exclusively on real estate and cattle (Scheel, personal communication 1989).

The distribution of credit is highly skewed. In 1986, 4.2% of the loans granted accounted for 79.1% of the credit funds. Moreover, the criteria for allocating credit is not based on economic efficiency. For example, in 1988, the agricultural sector generated 25.6% of GNP but received only 16.2% of the credit. On the other hand, the industrial sector generated a smaller percentage of GNP but received over 30% of the credit.

Within the agricultural sector, distortions in credit allocation also prevail. More than half of the credit is allocated to the three main export crops, coffee, sugar and bananas, and only 15% to the production of food. The

banks provide no financing for small-scale farming, which they consider to be the responsibility of BANDESA.

Finally, banks issue few loans for medium- or long-term investments. Over 75% are one-year loans for working capital. This significantly affects economic activities requiring large fixed investments, such as perennial crops and forestry production. The lack of credit available for long-run investments discourages the adoption of long-run sustainable natural resource management

4.2.3 Fiscal Policies

Public Sector Expenditure Policies. "While Guatemala has been second only to Costa Rica in income per capita, the country historically has spent less through its public sector than any of its Central American neighbors. Guatemala's disciplined fiscal management up to 1980 contributed significantly to the price, wage and exchange rate stability the country enjoyed" ("Guatemala's Economic Performance", USAID/Guatemala, 1989). However, there was a cost associated with the failure of the public sector to provide the social overhead capital required to conduct a modern, efficient economy. As discussed in Chapter 2, low historical rates of public sector investment in health, education and other areas of human capital development, have prevented the economically disadvantaged indigenous population from breaking the poverty cycle.

As discussed in Chapters 2 and 3, low levels of government expenditures has translated into limited funding of institutions mandated to implement natural resource policies and limited resources to coordinate activities.

Tax Collection. For the thirty years prior to 1980 tax collections averaged less than 8 percent of GDP. Out of the relatively small tax collections, indirect taxes accounted for 86 percent (Guatemala's Economic Performance", USAID/Guatemala, 1989). Policy incentives for long run natural resource management which rely on direct taxes are not effective.

4.2.4 Macroeconomic Policy Research Issues

A complete analysis of how macroeconomic policies impact the management of natural resources in Guatemala goes beyond the scope of this inventory. However, there are several key policy issues that merit future research under RENARM:

- Study the shifts in demand for specific natural resources across regions of Guatemala from changes in macroeconomic policies such as interest rate and exchange rate controls.
- Study policy alternatives that integrate natural resource management issues into macroeconomic policies.
- Study policy alternatives that simultaneously promote long-run sustainable management of natural resources and create demand for excess labor.

- Study the potential impact of the release of controls on interest rates on:

  - the degree of competitiveness in credit markets;
  - the supply of credit for medium to long-run investments.

4.3 Sector and Subsector Policies in Guatemala

The summary tables below provide lists of the sector and subsector policies identified for each natural resource issue and places them in their respective policy categories. After each summary table, the policy issues are presented.

For specific information on a policy listed in a summary table, the reader is referred to the Policy Inventory Tables in Volume III. These tables, one for each policy listed in the summary tables, are organized first by natural resource categories and second by policy categories (i.e. Sustainable Agricultural Tables are first under the following policy categories: Fiscal, Trade, Regulatory and Development; followed by Production from Natural Forests with the same policy categories).

Each policy inventory table contains the basic components of the inventory:

1. The policy
2. The objectives
3. The institutions
4. A qualitative assessment of the policy impact on short run economic growth, the natural resource category in the short run, the long run economic growth, and the natural resource category in the long run.
5. A brief explanation of the policy impact
6. The principal alternatives suggested for analysis

TABLE 4-B

SUMMARY TABLE
SUSTAINABLE AGRICULTURE

FISCAL:
TAX INCENTIVES FOR DECENTRALIZATION

TRADE:
EXPORT PROMOTION BEEF
EXPORT PROMOTION NONTRADITIONAL COMMODITIES

REGULATORY:
PROTECTED AREAS LAW
PESTICIDE LAW

DEVELOPMENT:
PETEN COLONIZATION
AGRARIAN TRANSFORMATION LAW

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4.3.1 Sustainable Agriculture

Policy Overview. The inventory identified seven major policies which have direct effects on sustainable agricultural production. However, there is an extensive set of policies which foster or discourage sustainable agriculture. Land use, price, export and credit policies and the regulation of pesticides have significant effects. Colonization policies in the Peten have resulted in the promotion of unsustainable agriculture. However, the new protected areas law calls for land use policies that match soil type and appropriate land use to actual land use.

Fiscal Policies. The policy to decentralize industrial activity outside the Guatemala City metropolitan area has the potential to harm the environment because its possible impacts on the water resource base is often not carefully considered. This policy could also have highly positive effects. On the other hand, if industries are established in the production areas (i.e. Teculutan, Zacapa), this policy could have highly beneficial effects, as in the case of agroindustrial and forestry plants that become a source of prime material, employment and revenues in rural areas. This would help stem the current migration flow to urban areas.

The Agrarian Transformation Law establishes a tax on idle or uncultivated lands. Because the tax rate is so low (from Q.0.75/hec to Q.2.50/hec on declared idle lands) and in some areas affects the interests of power groups, application of this policy has been very limited. In addition, the law is ambiguous in its definition of idle lands, leaving the declaration of such areas to the interpretation of the persons applying the law. The mechanism is thus open to corruption.

Trade. Trade policies analyzed in reference to sustainable agriculture include beef and export promotion for nontraditional products. The principal purpose of these policies is to diversify exports and to obtain dollars. Cattle ranching has expanded on karstic tropical forested areas in the Peten, causing extensive loss of forests and plant and animal species as well as soil degradation.

The nontraditional export products policy has had a positive impact on the market balance of the country in the last few years, expanding from a relatively small share to an important part of the national economy. However, by exclusively cultivating exportation products, small farmers face additional production and marketing risks, partly through their increased dependency on imported inputs and the international market demand for their crops.

The environmental impact of this policy has also been significant, especially in the highlands, where water is scarce, plot size is small and the economic resources of the owners are limited. Nontraditional crops have substituted for some basic consumer products and have been cultivated with intensive agricultural practices on small-scale farms that may not necessarily have the best or even average soils. This has necessitated greater use of pesticides and fertilizers in addition to the use of creeks in the western and eastern highlands. The result has been competition for water in rural communities and in some cases exhaustion of the water source. These crops cannot

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be considered part of sustainable agriculture if they do not allow for the permanent and continuous use of natural resources.

The taxes on agricultural inputs affect the cost of export crop production and technical production of basic grains. Technical agricultural production and the competitiveness of export products in the world market are constrained by the rising costs of fertilizers, insecticides and fungicides. Also, import tariffs affect certain agricultural products such as beef, milk, cereals, fruits and vegetables. These policies tend to protect internal production of these products. The National Commission of Tariff Policies and the National Commission of Economic Integration determine exceptions or modifications to these policies. MAGA does not have representation in these organizations and as a result, the tariff system may not be fully adjusted to the sector's promotion policies.

MAGA does provide farmers with some low-cost agricultural inputs which international organizations have donated. The impact of this policy is restricted to certain seasons and specific products. These inputs mainly favor small farmers cultivating basic grains. The revenues from the sale of these products go into a private fund whose administrative and investment policies have not been clearly defined.

Regulatory. Within the regulatory policies, the Protected Areas Law (Decree No. 4-89) is considered to be compatible with sustainable agriculture. This law states that degradation of natural resources should not be promoted in areas where the natural situation (i.e. genetic resources, biological diversity) does not allow conservation. Because the law was only recently issued, it has not been fully implemented.

The Compulsory and Promotional Law of Basic Grains Cultivation requires that all private farms dedicated to agricultural or livestock activities set aside 10% of their land for cultivation of basic grains (rice, corn and beans). The law has had little effect, however, due to the lack of incentives and technical criteria for effective implementation.

In addition, the Regulating Law on the Importation, Creation, Storage, Transportation, Sale and Use of Pesticides states as its objective the regulation of these activities in relation to public health, agriculture and livestock. It authorizes the Ministries of Public Health, Economy and Work to establish norms that will allow compliance with the law. In the short-run, proper implementation of the law retards agricultural activities and therefore results in a negative economic impact; however contamination of soil, water and the environment in general is reduced. Conflicts between economic development and resource management objectives subside in the long run. For instance, if integrated pest management is used, productivity increases and the natural resources are better managed. Also, natural regeneration will improve water supply and soil resources.

Development. Development policies, principally the colonization and exploitation of the Peten's natural resources and the Agrarian Transformation Law, have had different effects on their "beneficiaries." Through colonization, not the integral agrarian restructuring, large extensions of land have been granted to a small capital-rich minority, resulting in the establishment of large

new cattle ranches in areas with karstic soils. In addition, lands have been granted to small- or medium-size farmers that cultivate corn and beans (low-yield agriculture) and receive little government support, causing the farmers to change sites as the soils rapidly become unproductive.

The Agrarian Transformation Law has functioned well only in areas outside the department of Peten and mainly on national land (government farms). Moreover, the law has had little effect on any efforts to make use of idle lands or to balance the current structure of land use and tenure.

Credit policies for agricultural development are applied by BANDESA. Agricultural credits with guarantees, low interest rates, and preferential conditions for terms of payment are provided to farmers. The credits provided from trust funds are especially important.

In addition, the Bank of Guatemala administers many funds created by the Government to promote high-priority production activities. The funds provide producers with credits under preferential conditions through the banks. Ten government funds were operating in 1986, six of which focused on agricultural activities.

- Fund to Promote Agricultural and Livestock Activity
- Fund for the Cultivation of Rubber
- Fund for Cattle Development
- Fund for Agricultural-Livestock Activity
- Fund for the Fruit and Vegetable Marketing Program

These policies promote the economic growth of the agricultural sector, giving it a relative advantage over the forestry sector, which has no credit incentives other than the project involving massive reforestation of 5,000 hectares in the northeast. Land clearing and the use of modern agricultural technologies and pesticides are favored under these policies.

Policies relating to price ceilings and supports are determined by the Internal Commerce Directorate of the Ministry of Economy. In reality, price supports are established for only six areas, of which the most important affecting the agricultural-livestock sector are milk, gasoline, diesel and propane, flour and sugar.

Determination of price ceilings for basic grains (rice, beans, corn and sorghum) are the responsibility of INDECA. In the last few years, INDECA has lacked sufficient funds to purchase these products and continues to have little capacity to intervene in controlling market prices. INDECA does not fix prices but provides price references to buyers and sellers and, depending on its capacity, may intervene in the market.

Two variables have an important impact on the commercial sector in relation to price policies. The first is the very limited government capacity to control consumer prices, and the second is the impact of government expenditures, specifically to maintain the stability of gasoline, diesel and propane prices. The price supports on petroleum products have a direct effect on energy demands, due to the competition between hydrocarbon products and forest products as

sources for energy.

The price policies being implemented by the Internal Commerce Directorate are leaning toward the total liberation of prices in the short term. This is a condition for negotiating loans from international organizations.

As part of the colonization projects in the Peten and the Franja Transversal del Norte, rural roads were constructed to provide the land beneficiaries with a means of getting their products to market. However, these roads were poorly constructed and do not cover all colonized areas. USAID has been providing funds for the construction of rural roads by the General Directorate of Roads (CAMINOS). These roads have not only enabled farmers to get their produce to market but also to intensify and diversify their products.

The lack of electricity in some areas of the highlands has limited the construction of small irrigation wells needed for sustainable agricultural practices in the region.

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TABLE 4-C

SUMMARY TABLE
PRODUCTION FROM NATURAL FORESTS

FISCAL:
STUMPAGE TAX
FISCAL INCENTIVES: FORESTRY LAW

TRADE:
EXPORT PROMOTION OF BEEF
TIMBER EXPORT RESTRICTIONS
EXPORT PROMOTION OF NONTRADITIONAL COMMODITIES

REGULATORY:
PROTECTED AREAS LAW
FORESTRY LAW:
- CONCESSION AND MANAGEMENT PLANS
- DOMESTIC USE OF FORESTRY PRODUCTS
- FINES FOR VIOLATIONS
- LICENSING OF TRANSPORTATION
- REGULATION OF CHANGE IN LAND USE

DEVELOPMENT:
PETEN COLONIZATION
AGRARIAN TRANSFORMATION LAW
PRIVATE SECTOR REFORESTATION
AGRO FORESTRY MANAGEMENT PROJECTS
REFORESTATION PROGRAMS
10% FORESTED LAND: FORESTRY LAW

4.3.2 Production from Natural Forests

Policy Overview. The main policies on this subject are contained in the Constitution, the Forestry Law and the Law of Protected Areas. Other laws and administrative measures also affect the production from natural forests, including the Law of Agrarian Transformation, the Law of Peten Lands, the Law of the Creation of FYDEP and the Law of INDE.

The institutions with significant roles in this sector are DIGEBOS, FYDEP and the Liquidating Commission of FYDEP.

Fiscal Policies. The income tax incentive for reforestation and the stumpage tax based on standing wood value are the most important fiscal policies concerning the production from natural forests.

The previous forestry law also allowed a deduction of up to 50% of income tax for investment in forest plantations. This incentive had limited effects, however, due to bureaucratic difficulties in its application. Application of the new forestry law is more attractive and feasible due to the requirement for the issuance of Forestry Investment Certificates. The regulations for the new law, which must be issued by March 1990, are critical to ensuring that this incentive achieves its greatest potential. To be effective, the procedures specified by the regulations must apply to all parties, not solely to high income companies and persons. (Present procedures discourage small and medium investments.)

The felling tax on the value of standing wood, applicable to wood cut in natural forests (voluntary plantations are exempt), is a recent policy which has not yet been applied (Article 94, Decree No. 70-89, effective January 20, 1990). The new forestry law does not include the 2% tax on sales of industries using forestry raw materials and the municipal tax on felling of coniferous and high value hardwood which were in the previous forestry law.

It is difficult to predict the ecological and economic impact of the felling tax since it radically alters the fiscal regime on wood production from natural forests. On the one hand, studies on the value of forests will be required as a result of this tax, which could lead to a more rational use of forests. On the other hand, it could discourage legal forestry management activities. In any case, application of this tax requires greater technical support from DIGEBOS.

Trade Policies. Export promotion of nontraditional products and beef and restrictions on wood exports are the trade policies affecting production from natural forests.

The promotion of beef exports through a relatively preferential rate may stimulate the felling of forests for grazing. This would have a negative effect on forestry activities in the long term but would increase current wood availability. The magnitude of this effect has not been considered, however.

The promotion of exports of nontraditional products may directly or indirectly affect natural forests. Directly promoting exports of nontraditional products of high added value would stimulate forestry activity and raise the

value of natural forests. By promoting agricultural exports, the use of land is indirectly intensified and pressure to use forestry lands in agriculture is reduced. In addition, the use of advanced agricultural technology is intensified.

The prohibition on the export of logs is intended to promote the timber industry, thus increasing the value of forestry export products. Since the timber industry, especially the sawmills, is working at only 30% of capacity, this policy is expected to promote the country's economic growth as well as forest conservation. However, studies on expanding markets for forest products and increasing industrial installed capacity will be needed before major benefits can be derived from this policy.

Regulatory. The regulatory policies are covered by the Forestry Law and the Law of Protected Areas. The Forestry Law contains guidelines for the use of forestry products in the country, while the Law of Protected Areas regulates forest management within the declared conservation areas. However, the inexact delineation of geographical boundaries and the lack of plans to manage conservation areas creates uncertainty among private owners and in DIGEBOS regarding forest management regulations in protected areas. Studies must be conducted to determine borders and management needs in these areas.

The Forestry Law requires that anyone requesting permission to use forests present management plans and transport licenses to DIGEBOS. However, if DIGEBOS' technical capacity is not strengthened, these regulations will be ignored, leading to illegal activities and inappropriate forest management techniques.

The Forestry Law guidelines regarding land use changes and protection of mangroves and watershed recharging zones will be impractical unless specific strategies are designed to carry out these policies.

The prohibition on the cutting of protected tree species that are in danger of extinction in natural forests is an important regulatory policy included in the Forestry Law (Article 22) and closely tied to the Protected Areas Law. The identification of these species is based on international agreements accepted by Guatemala and a listing issued by CONAMA/CONAP. Short-term effects of this measure on natural resource conservation could be positive. Long-term effects depend on conservation of the ecosystems to which these species belong. The short-term economic benefits will be negative since the prohibition impedes the production of certain woods. However, few of the tree species that are currently being exploited are included in these lists or agreements; as a result, the impact will be relatively minor.

Regulatory aspects of the law can be important, especially in areas such as transportation licensing, prohibition of exports, controls on domestic uses of forest products, control of private forest conversion and the fine and penalty system making up these as well as other articles in the law. The Government cannot effectively control domestic uses of forest products on private property. Similarly, there will be enforcement problems regarding land use changes on private land. The penalty system for violations of the Forestry Law is inadequate because the level of fines is insignificant compared to the large economic gains from disobeying the law. Moreover, the judicial process which

issues the penalty is slow and not well coordinated with DIGEBOS.

Including the Peten under the jurisdiction of DIGEBOS is one of the most important changes mandated by the Forestry Law. This change theoretically entails progress toward the application of a national forestry management policy. In reality, however, this effect will be limited because DIGEBOS would have to increase its coverage using its existing scarce economic resources.

Forest management and the granting of concessions on public land, depending on the quality of supervision, can have a major impact on the use of resources. However, the ten-year concession was not the recommendation of either DIGEBOS or CONAMA but the result of a legislative decision based on concessions in other sectors.

Development. The colonization policies in the Peten, the Agrarian Transformation Law which promotes transferring land to small settlers, the Agricultural Credit Programs and the opening of rural access roads are the main measures negatively affecting long-term forestry production. The most important consequences are forest felling and burning to prepare the land for agricultural uses.

Both the new and the old law require INTA to leave 10% of colonized land for forestry purposes. This aspect of the law has never been implemented by INTA, however. DIGEBOS has the responsibility to analyze the environmental effects of INTA's proposed environmental projects, but the actual ability of DIGEBOS to affect INTA decisionmaking process is questionable. There is a large property in the FTN that was recently purchased by INTA which supposedly is suitable only for forest management. Nevertheless, these policies, if successfully implemented, could have long-term economic and natural resource benefits, despite their short-term economic costs.

The projects involving communal forest management (AID/DIGEBOS), agroforestry development (DIGEBOS/CARE) and massive reforestation of the east (DIGEBOS/CORFINA) have had some benefits though their success has been relatively limited.

The strategy of the relatively successful Massive Reforestation of the East Project needs restructuring in order to be compatible with the industry and to solve bureaucratic problems affecting granting of credit and technical assistance to users. Despite the enthusiasm and good will of its staff, the promotion of DIGEBOS promotion is limited by the slow endowment of funds and the absence of administrative support.

The reforestation projects promoted by INDE and the Ministry of Energy and Mines and others (EMPAGUA, Army) have not had a significant impact. The creation of the Fondo Forestal Privativo (Private Forest Fund) and the Fondo de Fomento Forestal (Forest Promotion Fund), as well as the incentive to small owners in Article 90 of the Forestry Law, could have a very significant impact if DIGESTBOS could adequately implement the regulations to the Forestry Law.

Major Findings. The Forestry Law (Decree No. 70-98), effective January 20, 1990, contains the most important policies affecting natural forest production.

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This law is different in some respects from the previous law (Decree No. 18-84), including the following:

- The Department of the Peten has been added to the coverage of the new law. DIGEBOS will now have responsibility for the entire country, whereas FYDEP previously administered the Peten.

- Forest management is emphasized. The previous law was primarily regulatory with little emphasis on forest resource management.

- More fiscal incentives for reforestation are anticipated under the new law.

- The law replaces the 2% sales tax on wood products and with a stumpage tax.

- The law introduces specific conservation categories such as mangroves and watersheds as well as specific endangered tree species.

- The law will not deal with protected areas which were included in the previous law. Those areas are now addressed in the Protected Areas Law.

- The law establishes concessions on public land that is outside of conservation areas and that has special management requirements. The regulations will determine the general terms of these requirements, while the management plans will have specific requirements for such areas. In the Peten this should result in more controls than there were under FYDEP.

- A number of aspects of the new forestry law affect municipal governments. For example, 10 percent of urban land parcels are to be dedicated to forests, and municipalities grant forest concessions on their land.

Institutional Capacity of DIGEBOS. There is little question that DIGEBOS is inadequately staffed to meet the challenges of the new law, especially given the addition of the Department of the Peten to its area of responsibility. The staff of 124 members has approximately 40 agronomists and almost no foresters. Like many other government agencies, DIGEBOS is under funded and thus unable to purchase adequate equipment or hire needed personnel; the agency does not even consistently meet its payroll on time.

Both DIGEBOS and CONAP have little institutional weight and limited experience in dealing with the large and powerful vested interests in the Peten, let alone with illegal land conversion on public land. In the past, various interests were represented in FYDEP, although it was primarily an instrument of the army. The selective cutting of high-value trees was often followed by informal colonization and large land holdings were distributed on the basis of favoritism.

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Given these conditions, it is necessary to improve the institutional capacity of DIGEBOS. Otherwise, the components of the new forestry law will not be implemented effectively, with the possible exception of the fiscal incentives for private forestry.

TABLE 4-D

SUMMARY TABLE
WATERSHED MANAGEMENT

FISCAL:
TAX INCENTIVES FOR DECENTRALIZATION

TRADE:
EXPORT PROMOTION OF BEEF
EXPORT PROMOTION OF NONTRADITIONAL COMMODITIES

REGULATORY:
MANAGEMENT OF MANGROVES
PROTECTION OF FORESTS IN WATERSHEDS
RESERVE AREAS LAW
PESTICIDE LAW
EFFLUENT WATERS LAW
HEALTH AND MUNICIPAL CODES
PROPOSED WATER LAW
PROTECTED AREAS AND HUNTING LAWS
ENVIRONMENTAL LAW
MINING CODE
WATER USE PERMITS
HYDROCARBONS LAW

DEVELOPMENT:
HYDROELECTRIC INVESTMENT
COLONIZATION
PUBLIC ACCESS TO WATER SUPPLY

CONAMA has also supported itself on regulations other than the Political Constitution and the Civil Code. They include the Health Code, the Municipal Code and Regulations, the Mining Code and the Hydrocarbon Law. These regulations have allowed some legal actions to be taken, such as the requirement for an EIA in the XAN petroleum well in the Peten.

Within the regulatory policies, the Regulating Law on the Importation, Creation, Storage, Transportation, Sale and Use of Pesticides and its Regulation, states its objective as regulating these activities in relation to public health, agriculture and livestock. It authorizes the Ministries of Public Health, Economy and Work to establish norms that will allow compliance with the law. In the short-run, proper implementation of the law retards agricultural activities and therefore results in a negative economic impact; however contamination of soil, water and the environment in general is reduced. Conflicts between economic development and resource management objectives subside in the long run. For instance, if integrated pest management is used, productivity increases and the natural resources are better managed. Also, natural regeneration will improve water supply and soil resources.

The recently issued Forestry Law (1990) has a direct relationship with watershed management in Articles 3, 21 and 44. These articles require the special conservation of forests in critical watersheds because of their importance for recharge of the water supply. They also include the management of mangrove forests because of their high productivity, the importance of their ecosystems and their potential as an income source for the local population. Articles 20 and 27 relate to protected areas and were mentioned in the previous section (production from natural forests). Because this law is new, DIGEBOS has not begun implementation; nevertheless, once implemented, it will have a positive impact on watershed management.

Although the Protected Areas Law was discussed in detail in the previous section (management of wildlands), it has some relevance to watershed management. This law, like the Forestry Law, also requires the protection of the protected areas at higher elevations because of their water production capacity as recharge zones. Because the Protected Areas Law was recently issued, implementation by CONAP has just begun. This law also includes the protection of national reserve areas (3 km of the ocean coastal zones, 100 meters on both sides of rivers, 200 meters around lakes and 50 meters around springs). OCREN is responsible for protecting these areas, in coordination with CONAP.

The Fishing Law has existed since 1930, with some modifications through the years (i.e. 1957). Some technical decisions have been taken because the law is considered obsolete (Salaverria, 1987). The law establishes closed seasons, fishing requirements, a tax, a limit on licenses, and other measures. A proposed law was developed in 1989 and is currently being studied by the different interest groups. This new law could have a negative short-term impact on the economy because it would not stimulate fishing activities. On the other hand, the long-term impacts on economic and fishing resource would be positive due to conservation and management of the resource.

Guatemala has many laws that regulate the use of water resources and property related to irrigation. These laws are scattered through the National

Constitution and a number of codes, decrees, and rulings. While laws exist, Guatemala lacks effective authority to implement national water policy and to control the development of water resources. In 1989, a comprehensive proposal that seeks to consolidate water legislation in one document was completed. However, the proposal does not specify the authority that will be charged with management of water resources, a problem currently being addressed by a task force ("Irrigation Sector Assessment," 1989).

The law creating the National Institute of Electrification also includes a requirement to protect the development and use of available natural resources, such as sources for electrical energy. Among its purposes and obligations, INDE is required to make rational use of natural resources in order to help stop the destructive exploitation of these resources. In compliance with this requirement, INDE promotes the use of electrical heating for homes instead of the use of imported materials and/or firewood from national forests.

Development. The policies that have had the greatest impact on natural resources have been development policies. Colonization of the Franja Transversal del Norte (Northern Transversal Strip), land grants in the Peten and other northern areas of the country, development of national farms and cooperatives, and the reorganization of small farmer plots, especially in the western highlands, are all policies included in the Constitution (Articles 67 and 68), the Agrarian Transformation Law (Articles 12 and 14) and the National Development Plan (1987-1991).

INTA has been the institution responsible for providing land to landless workers in all areas except the Peten. FYDEP was responsible for land grants in the Peten before its liquidation began. The creation of FYDEP and the Agrarian Transformation Law have not favored conservation of natural resources. Specifically, these policies led to the destruction of large forested areas, changes in the availability and quality of water, and the loss of soil, valuable genetic resources and biological diversity.

The Political Constitution of Guatemala (Article 127) states that "all waters belong to the public domain, inalienable and imprescriptible. Their rational use shall be authorized based on the law, in consideration of social interests. A specific law will regulate this resource." The National Development Plan 1987-1991 makes the rational use of water a priority, with the following areas of use listed in order of importance: drinking water, irrigation and hydroelectricity.

Nevertheless, there is still no law that regulates the water resources. The only government office authorized to control water use is the Technical Directorate of Irrigation and Drainage, which is responsible for issuing water use permits. However, its regulatory capabilities are limited and mainly concentrated on irrigation. As a result of these limitations, the municipalities control the resource for the drinking water supply and the INDE for hydroelectricity.

Of the total population, 50% have access to drinking water and 33% to sewer and refuse services. The demand for water can thus be expected to increase in both the short and the long run. In addition, only 125,000 of the 500,000

hectares that could be irrigated are currently under irrigation (DAI 1989). Due to the importance of agriculture to GNP, the labor force as a source of revenue, and the more than 375,000 hectares that could be irrigated, an increase in demand for irrigation water can also be expected in both the short and the long run.

Guatemala's energy requirements have been met mainly by firewood and petroleum products, 63% and 30%, respectively (Braceli 1985). If any structural changes are made, the hydroelectric demand for water will increase. External factors resulting from any reduction in water quality or change in water availability for domestic, agroindustrial, irrigation and hydroelectric uses must be considered restrictions on the rational use of the water resource.

Without the institutional coordination and administrative restructuring that clarifies the responsibilities and objectives of the governmental and non-governmental sectors, planning in each institution will be fragmented and overlapping. For example, in Guatemala City any person or entity that opens a well for domestic or agroindustrial use, or for dumping domestic or industrial residual waters without treatment is violating the following laws and regulations: Article 127 of the Political Constitution; Law for the Protection and Improvement of the Environment; Health Code; Municipal Code and Municipal Regulations; and the Regulation of the Maximum and Minimum Permissible Contamination for Discharge of Residual Waters. Nonetheless, these activities occur often without any control or permit.

In addition to violating all the laws mentioned above, the conflict increases in relation to the use of the water. Guatemala City is located in the highest part of the Maria Linda and Motagua watersheds that flow into the Pacific and Atlantic Oceans, respectively. Because of this location, the availability of superficial water is limited and dumping of residual waters limits the use of these waters down river. In general, similar problems exist in all the municipal seats. In short, Guatemala has laws and regulations for drinking water and sewer services but they are neither applied nor enforced.

To date, INDE has been the governmental institution that has had the strongest indirect impact on water resources. This influence has resulted from the large government investments made in recent decades on hydroelectric projects such as the following: Jurum Marinala, Los Esclavos, Aguacapa and more importantly, Chixoy. These projects have not included or considered a management plan for the affected watersheds and the repercussions of this omission have affected the natural resources. In 1989, the Management Plan for the Higher Watershed Zone of Chixoy was developed and in 1990, the projects developed under that plan will be implemented. Also, feasibility studies of the management plans for the Xaya and Pixcaya sub-watersheds will be initiated.

Major Findings. Fiscal policies for industrial decentralization can have a positive impact on short-term economic growth. If no research is done to determine the extent of water pollution from the discharge of residual waters, the impact on economic growth and natural resources could be severe.

Trade policies, specifically on nontraditional products, could have a strong impact on economic growth and natural resources. Nevertheless, sustained

development that guarantees an improvement in the quality of life of small farmers and the reduction of negative impacts on the natural resources and the environment should be researched.

Control by regulatory laws is inefficient, because the laws have been insufficiently publicized and the lack of corresponding regulations means high costs for existing control systems.

Regulation of water use has and will have a significant impact on water management as a result of the increased coverage requirements for drinking water, irrigation and hydroelectricity.

Both the Constitution and the National Plan try to change the methods of water utilization, which has resulted in the atomization of water for drinking purposes, archaic utilization for irrigation and monopolistic management of water for electricity.

The development policies for water resource projects (drinking water, sewer services, irrigation and hydroelectricity) have caused an increasing conflict over water use. The main cause of these conflicts is the lack of any real coordination between implementing institutions and policies that in one form or another promote competition between the institutions.

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TABLE 4-E

SUMMARY TABLE
MANAGEMENT OF WILDLANDS

FISCAL:
TAX INCENTIVES FOR DECENTRALIZATION
INCOME TAX EXEMPTIONS

TRADE:
EXPORT PROMOTION OF BEEF
EXPORT PROMOTION OF NONTRADITIONAL COMMODITIES
INTERNATIONAL COVENANTS ON ENDANGERED WILDLIFE
EXPORT RESTRICTION ON TRADE OF WILDLIFE

REGULATORY:
PROTECTED AREAS LAW
RESERVE AREAS AND AGRARIAN TRANSFORMATION LAWS
HUNTING LAW
ENDANGERED TREE SPECIES
REGULATION OF ENDANGERED SPECIES
PROTECTION OF CULTURAL HERITAGE

DEVELOPMENT:
LAND COLONIZATION (FYDEP)
AGRARIAN TRANSFORMATION LAW
TOURISM LAW

4.3.4 Management of Wildlands

Policy Overview. The Protected Areas Law and the Environmental Protection and Improvement Law contain the principal policies relating to the management of wildlands. In addition, although the Forestry Law, the Agrarian Transformation Law, the land policies applied by FYDEP in the Peten and the export promotion policies are directly related to other sectors, they have had important indirect effects on the conservation of wildlands.

Fiscal Policies. To date, the effects of fiscal policies on wildlands have been difficult to measure, although it is estimated that the impact of development and regulatory policies is relatively minimal.

Indirectly, industrial decentralization can cause water and air pollution in rural areas, which negatively affects biodiversity, especially in the long run. Before establishing industries in other areas of the country, it is important to carry out environmental impact analyses to minimize the effect on not only the immediate area but also the surrounding region.

The Protected Areas Law (4-89) states that individuals who dedicate their property or who are directly involved in research, promotion or development activities for protected areas and receive any income, are exempt from territorial and property taxes (Article 31 and 32, respectively). This policy could bring economic benefits in the short and long term for the owners or interested parties. However, very few persons would be affected by this law. Both the short- and long-term effects on natural resources will be positive and will depend on the number of persons affected by this law.

Trade. The export promotion of nontraditional products and beef has indirect negative effects on biodiversity and wildlands. Due to the promotion of nontraditional products, use of pesticides has increased and wildlife habitats have been contaminated. Extension of the cattle grazing lands that destroy forest ecosystems has reduced wildlife habitats, although this effect is difficult to measure. This damage has occurred mainly in the humid tropical areas in Izabal, Alta Verapaz and the Peten.

In relation to wildlife commerce, both the Environmental Law and the Protected Areas Law prohibit the exportation of protected wildlife species in accordance with international agreements. The success of this policy in protecting wildlife will depend on CONAP's allocation of the human and technical resources that are needed. Currently the serious lack of personnel and equipment in CONAP make compliance difficult.

Guatemala is a member of CITES (Convention on International Trade in Endangered Species) based on Article 25 of the Protected Areas Law (Decree No. 4-89). CITES attempts to stem the illegal commerce in endangered species (determined by CONAP's listings, Article 24). Article 22 of the Forestry Law also addresses this problem. CITES could have a positive long-term impact on both the economy and natural resources, considering the importance of conserving flora and fauna species whose use or potential is currently unknown but might be discovered at some future date.

Article 26 of the Protected Areas Law prohibits the exportation and marketing of wildlife species that are in danger of extinction (based on CONAP's listings, Article 24). Animals can be exported only if they are in the second generation that has been reproduced in controlled conditions under the direction of authorized individuals or legal entities that meet the law's requirements. Article 25 also applies to these species. If this law is enforced, the short-term economic impact could be negative since the economic activity would be curtailed. However, a limited number of persons are involved in this activity. The long-term impact on natural resources would be positive, since the endangered wildlife species would be protected. In addition, the economic impact for individuals meeting the law's requirements would be positive.

Regulatory. Certain provisions of the Protected Areas Law, the Forestry Law and the Agrarian Transformation Law have a direct impact on wildlands. The Protected Areas Law (Decree No. 4-89) establishes that it is in the national interest to restore, protect, conserve, and manage wildlife. This philosophy is supported in Chapter II, Article 5 of the law, which establishes that the general objectives of the law are to ensure the optimal operation of the essential ecological processes and the vital natural systems; to conserve the genetic diversity of wildlife; to support the sustainable use of species and ecosystems; to defend and preserve the natural heritage; and to establish the necessary protected areas.

Although this law was recently issued (January 10, 1989), some legal actions have already been initiated to protect wildlands. However, only five of the 50 protected areas included in the law have developed management plans, of which only four are being implemented.

Articles 21, 22 and 27 of the Forestry Law have a direct relationship with protected areas. These articles address the conservation of mangrove forests in Guatemala, prohibit the felling of protected and endangered tree species and restrict land use of reserve areas or areas within the National System of Protected Areas.

Article 27 prohibits the gathering, capture, hunting, fishing, transport, exchange, commerce and export of endangered wildlife species (based on CONAP's listings, Article 24). Article 25, along with Articles 25 and 26, favors the conservation of endangered species but negatively affects the collectors and merchants.

The General Hunting Law is closely related to the Protected Areas Law, specifically in Article 27. If applied, this law would have a negative economic impact on persons involved in hunting but would help preserve wildlife.

Development. The aspects of development policy that should be considered are land colonization and the exploitation of natural resources in the Peten and the Agrarian Transformation Law (Decree No. 1551).

Even when the stated purpose for the use of natural resources in the Peten has been economic and social development, damage and deterioration have occurred. Cultivation of clean crops (principally corn and beans) was temporarily established even at the cost of destroying large expanses of forest with the

resulting loss of valuable genetic resources and genetic diversity. In areas where cattle were grazed, soil deterioration or loss occurred, due to the karstic characteristics of the soil. The application of the Law Creating the National Company for the Economic Promotion and Development of the Peten (FYDEP) has duplicated the negative effects that have occurred elsewhere in the country. Not only has the land tenure problem not been resolved but the soils have been used inadequately.

Application of the Agrarian Transformation Law has not been favored the conservation of natural resources or biological diversity. Rather, this effort to provide land for subsistence agriculture has caused the loss of large forest and wildlife areas.

Articles 153, 154 and 156 of the Agrarian Transformation Law refer to the National Reserve Areas, which include a strip three kilometers wide along the oceans, 200 meters wide around lakes, 100 meters wide on either side of the rivers and 50 meters wide around springs. OCREN is the institution responsible for controlling these areas. If enforced, this regulation would entail the revocation or denial of concessions, which would have a negative impact on the economy. The long-term impact on wildlands would be positive.

Both the previous and the current forestry laws establish certain regulations on the land's productive capacity (Article 26) and stipulate that in all agrarian development areas forest cover must be retained on a minimum of 10% of the total land (Article 38). To date, these measures have not been applied.

Exploitation of Guatemala's tourism potential (i.e. Ruta Maya) would have a positive economic impact in both the short and the long term. The impact on natural resources, especially on the wildlands, would depend on both coordination between INGUAT and CONAP and the development of regulations protecting those resources.

Major Findings. The Protected Areas Law has introduced a substantial change in national policies relating to wildlife and wildlands. The most significant effects include the following:

- the creation of CONAP and SIGAP as mechanisms to develop and protect wildlife in Guatemala;

- the creation of new protected areas; and

- the definition of specific regulations needed to protect wildlife and manage protected areas.

Implementation of the Protected Areas Law would require personnel qualified at different levels and in various disciplines as well as strong administrative support. However, CONAP does not have these resources. In addition, special efforts should be made to manage the declared protected areas, most of which do not have defined boundaries or specific management regulations. Also, no clear strategies exist to make local community interests compatible with conservation requirements.

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The identification of areas as protected with no concrete measures for managing them is one of the biggest problems of this policy. The requirements far exceed the short-term capabilities for efficient management of the areas.

On the other hand, the Protected Areas Law establishes two types of fiscal incentive: an exemption from territorial taxes and an exemption from property taxes (up to 50%). These incentives are provided to those persons that dedicate either their land, in the case of the first exemption, or themselves in the case of the second, to research, promotion and development of protected areas. Because these are new and recently published policies that lack the necessary mechanisms and procedures for implementation, they still have not been put into practice. Because it is similar to the fiscal incentives for reforestation in the Forestry Law, the property tax exemption could significantly affect resources if the necessary mechanisms are established. On this basis, the exemption from territorial taxes can be expected to have limited application.

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4.4 Interdependent Natural Resource Policy Issues

Because policy effects cut across natural resource issues, several policies have been discussed in more than one of the four resource categories. Specifically, tax incentives for decentralization and pesticide regulations affected both sustainable agriculture practices and watershed management. The promotion of beef and nontraditional commodities has direct effects on sustainable agriculture, production from natural forests and watershed management. Land colonization policies and the protected areas law was discussed under all four resource categories. In most cases, the impact on the natural resources were similar.

5.0 IDENTIFICATION OF MAJOR RESEARCH AREAS

5.1 Sustainable Agriculture

Four major research areas were identified in the agriculture category: policy alternatives, institutional capacity building, technical assistance, and policy issues.

5.1.1 Policy Alternatives

- Improve decentralization policies by identifying areas where industrial development will not put pressure on the natural resources and good quality soils.

- Improve the criteria for defining idle lands. As the definition stands now, if forested land is cleared, it is no longer considered idle. Also, the definition of "idle" is not based on technical criteria, such as soil use potential.

- Establish operating plans for the Protected Areas Law so that land use in new areas sustains both the productive capacity of the land and the country's natural and cultural heritage. A fundamental requirement for conservation and rational management of natural resources is compliance with the Forestry Law and the Agrarian Transformation Law.

- Develop credit incentives and technical assistance mechanisms for areas suitable for basic grain production. Also, develop mechanisms for wider application of the Compulsory and Promotion Law for Basic Grain Cultivation. These steps would help promote sustained and rational production of basic grains for the country.

- Develop alternative incentives to maintain forest cover. Examine an implementation system which uses information on potential land use.

- Study alternatives for colonization policies, not only for the Peten but also for other areas governed by INTA. Execution of the integrated development plans, done previously in the departments of Zacapa and Chiquimula, could be considered, in addition to coordination of institutional efforts in this field.

- Develop the necessary mechanisms for agricultural credit programs to include the rational use of pesticides and to comply with the land use regulations contained in the Forestry Law.

5.1.2 Institutional Capacity Studies

- Analyze the public sector's resource needs for managing the regulatory laws affecting sustainable agriculture.

- Establish the mechanisms needed for MAGA to participate in the definition of tariffs, so sector priorities can be taken into account.

- Define the investment and administrative policies and mechanisms for agricultural inputs donated by international organizations. This will allow the best use of funds for programs such as rational pesticide use and IPM.

- Study how to improve the activities of MAGA/DIGEBOS-CONAMA in the Peten.

- Study and improve coordination between government institutions for sustained agricultural development.

5.1.3 Technical Assistance

- In karstic areas of the country, generation and dissemination of scientific and technological knowledge is needed in the agricultural sector. This would insure the technical, economic and social feasibility of the agricultural activities and the conservation and rational management of the natural resources.

- Determine the status of and recommend improvements in technical training for management and conservation of land and water resources in rural areas.

- Study alternative policy incentives for developing private sector capacity to manage forest resources along with sustainable agriculture.

5.1.4 Research

- Measure the impact of the Forestry Law on sustainable agriculture.

- Conduct an environmental impact analysis of nontraditional crop production.

- Study and determine the relationship between long-term policies of sustainable agriculture, forest production and the exportation of nontraditional products.

- Determine the long-term capacity of resource use (soil, water, forests) for sustainable agriculture on a regional basis.

- Identify agroecological zones, determined by the potential soil and land use based on climate conditions, soil capacity, and water resources, for intensive agricultural production.

- Study and recommend alternatives for resource management at the community level.

5.2 Production from Natural Forests

5.2.1 Fiscal Policies

Two priority research areas were identified in relation to fiscal policies. The first is the application and impact of fiscal incentives. The second, is the application of the stump tax based on the standing value of the wood. In addition, the following areas were recommended for further analysis:

- Develop mechanisms to apply fiscal incentives for reforestation to small- and medium-sized investors, along with other beneficiaries.
- Evaluate the possible burden of these incentives on government revenue collection compared to the projected ecological and economic benefits.
- Study and design detailed requirements for institutional strengthening of DIGEBOS to promote, coordinate, monitor and evaluate this expansion of fiscal incentives.

5.2.2 Trade Policies

The priority research areas for trade policies include application of the export promotion policy for nontraditional products and the prohibition on the export of wood with minimal processing. The following areas concerning production from natural forests need further analysis:

- Guatemala's advantage in wood products as compared to other world market suppliers.
- Policies and strategies for developing the wood products industry.
- The capacity of the local forest industry to raise timber product quality.

5.2.3 Institutional Capacity Building

Another priority research area is the institutional problems of DIGEBOS in implementing forest sector policies. The extent of the benefits of the new Forestry Law will directly depend on DIGEBOS' capacity to implement these regulatory policies. The following areas need further analysis:

- The structural characteristics, technical and administrative capacity and resources needed by DIGEBOS to comply with its legal responsibilities as defined in the Forestry Law and the Protected Areas Law, with special emphasis on the application of laws and activities in the Department of Peten.
- The specific regional policies, strategies and controls for forest administration and accepted technical guidelines to implement regional forest management activities. The management of humid

tropical forests in the Peten and the Franja Transversal del Norte needs special emphasis.

- The roles and relationships of DIGEBOS and CONAP for forest management in protected areas. Studies should be conducted to define borders and management characteristics of these areas.

5.2.4 Development Policies

The priorities for research on development policies are related to a) finding the mechanisms to improve the execution of projects; and, b) evaluating those policies that have a negative impact on the resource and proposing alternatives. For production from natural forests, seven areas were identified as requiring further analysis:

- Mechanisms to facilitate processing requirements for beneficiaries, to incorporate and increase the number of small- and medium-sized landholders in reforestation programs. Special emphasis should be placed on the Massive Reforestation Project of the East and incentive programs for small land owners (Forestry Law, Article 90).

- A strategy to coordinate all projects currently being implemented, not only for geographic area but for target population. Such coordination would have a significant impact.

- The relationship of reforestation and agroforestry projects to industrialization and marketing of forest products.

- The institutional capacity in both government and NGOs for executing forest development projects.

- Measures to reduce the negative impact of colonization policies, such as agroforestry or forest management.

- Ways to include the small farmers practicing migratory agriculture in tropical forest management activities.

- Land tenure and land use relationships in the Peten. Also, the effects of spontaneous migratory agriculture and agrarian parceling on forests.

5.3 Watershed Management

With respect to fiscal policies, Article 8 of the Environmental Law (requiring an EIA) must be followed prior to the establishment of any industry anywhere in the country. These analyses will minimize the negative impacts on downstream natural resources and users. Studies of territorial organization and zoning that contribute to reducing negative environmental impacts should be promoted in potential industrial development areas.

In the area of trade policy, quantitative research on the impact of the

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beef exportation promotion policy is recommended. Preliminary indications are that the economic and natural resource impacts of this policy are not significant.

When nontraditional products are promoted, products that place greater demands on soil and water are substituted for basic food crops. This trade policy affects the economy and natural resources, especially since it is a strategic objective of the National Development Plan 1991-1995. As a result, superficial water sources could be exhausted, and soil and water contaminated, with serious consequences for both local and downstream users. In addition, the substitute is highly dependent on the international market and on agricultural inputs, which increases risks for small farms with scarce economic resources. With respect to the development of production systems, the impact on local and downstream natural resources (with emphasis on soil and water) and the medium- and long-term economic effects on small farmers should be studied.

Regulatory policies (Environmental, Forestry and Protected Areas Laws and Water Use) should be publicized nationally through programs designed specifically for Guatemala. These laws will be more effective if their corresponding regulations are issued (i.e. The Regulation of the Maximum and Minimum Permissible Contamination for Discharge of Residual Waters).

Very little attention has been given to the development of human resources in the specialties of forest, environmental impact and management of protected areas in Guatemala. Technical training and development systems should be created or improved to develop effective regulations and control and monitoring systems.

In general, institutional structures should be analyzed to improve the enforcement systems for these laws. Also, strengthening the institutional capacities of CONAMA, DIGEBOS, CONAP and DIRYA should be a priority.

Finally, in the area of development policy, it is recommended that all water resource projects be consulted by the National Advisory Committee for Watershed Management (CONAMCUEN), which should be reinforced with human and economic resources. CONAMCUEN is promoting the development of the Master Plan for Natural Resources, which includes the Master Plan for Water, Soil, Forests and Wildlands. In addition, a Master Plan for Irrigation and Conservation of Soils and Water should be developed; specifically, studies should be carried out on the level of development in these areas and how the exploitation of water and soil resources contributed to it. This information could be used as the basis for developing future water and soil legislation. Last, the National Water Plan and the Master Plan for Electrification should be updated to include watershed management.

Proposed research areas include the relationship between the high, middle, and low parts of watersheds; the downstream effects from the high part to the middle and from the middle to the low part of the watershed; territorial divisions and zoning; regulations corresponding to unregulated laws; EIAs for development projects; and institutional strengthening that will result in operational and efficient control and monitoring systems.

While mangrove areas are relatively limited in Guatemala, they have

important and conflicting economic uses. If we examine the entire mangrove system and not just four species, significant industries are affected including shrimp, charcoal and salt production. Some observers believe that ecotourism could also take advantage of these areas of interest. DIGEBOS will need to consider the economic as well as ecological interactions as it develops plans for the mangroves. It may be relatively easy to control large industry problems but much more difficult to control individual access.

5.4 Management of Wildlands and Biodiversity

In the area of fiscal policy, alternative mechanisms for implementing income tax deductions need to be studied and the impact of the tax on reserve/protected area conservation and fiscal collection must be evaluated.

In relation to trade policy, studies must be carried out to determine the environmental impact of intensive agriculture activities for exportation and the utilization of both wood and non-wood forest products. This would provide a basis for policies that promote production and management technologies that have the least impact on wildlife.

The following priority research actions were identified for regulatory and development policies:

- Strengthen the technical and institutional capacity of CONAP.
- Clearly define roles and relationships of CONAP and its institutional members. Also, define coordination and cooperation mechanisms.
- Develop buffer zones management strategies that include the participation of local rural communities.
- Design, promote and regulate the ecosystems within protected areas.
- Protect ecosystems that provide a habitat for species for which commerce and exploitation are prohibited. (If the ecosystem is not protected, biological diversity will be lost in the long run, despite the prohibition.)
- Study political power structures in relation to natural resource management in declared conservation areas.
- Conduct studies to define the exact location and feasible management of declared conservation areas covered by the Protected Areas Law.

5.5 Conclusions

Although these prevailing patterns and policies of development in Guatemala have been formed with positive intentions and have created some beneficial outcomes, it is also now recognized that the prevailing approaches have many

long-run negative effects on the natural resource base. This path of development may have encouraged deleterious practices of resource exploitation and contributed to serious environmental degradation.

Policies directly addressing environmental or natural resource issues have helped to some extent to alleviate certain problems, but it has become clear that many of the existing policies are ineffective because of being ill-conceived, unenforced, or constrained by contradictory policies and conflicting political-economic pressures. The crucial constraint in effectiveness is that the policies often fail to address and confront the underlying causes of skewed distribution of political power and economic resources, population pressures and poverty.

One of the main challenges in forming new development strategies is balancing environmental conservation with pressing goals for economic growth. Innovative policies must be designed to mesh environment and development objectives. In some cases, conflicts arise and difficult choices and trade-offs must be made between conservation concerns and economic growth objectives, and between long-term and short-term interests. However in the many cases, these objectives are mutually reinforcing. That is, sound resource management and conservation measures help ensure sustainability of production. Moreover, progressive changes toward establishing and implementing long-run sustainable natural resource policies (such as promotion of agroforestry or soil conservation measures) can open up new economic possibilities, leading to structural changes in production and employment and access to new markets and trade opportunities.

APPENDIX A

INTERVIEWS CONDUCTED AND POTENTIAL CONTACTS FOR FURTHER RESEARCH

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2. United States Contacts

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Rene Costalles, Ed Farnsworth; IDB.

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APPENDIX B

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APPENDIX C

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4.3.3 Watershed Management

Policy Overview. The inventory identified eighteen policies, mostly regulatory, with significant effects on Watershed Management. The current and potential effects of fiscal, trade, regulatory and development regulations and policies on watershed management are important, especially the regulatory and development policies. The most critical gaps hindering the effective management of watersheds are the lack of a comprehensive water use law and lack of enforcement of exiting laws.

Fiscal. Within the fiscal policies, the decentralization policy has negative effects on water quality due to the discharge of residual industrial waters. The water use charge policy (Government Agreement No. 11-80) requires that quotas be established to cover maintenance and operation costs and the payments for irrigation projects infrastructure.

Trade. Trade policies cover the export of beef and nontraditional products. The latter needs detailed analysis, especially in the highlands, where water is scarce, plot size is small and the economic resources of the owners are limited. In areas situated in the highest part of the watershed, the overexploitation of the water sources and contamination of the soil and water caused by agrochemicals will negatively affect the users down river. Nevertheless, certain technologies and the tradition of cultivating corn (which requires less soil and water) has allowed the conservation of the natural resources in some areas. Another trade policy that affects watersheds is that of shrimp exportation. Exportation of shrimp larvae was prohibited in 1985, several months after MAGA had authorized export at the request of individuals involved in the activity (Salaverria 1987).

Regulatory. Watershed management is affected by a series of regulatory policies that include the following, in order of importance: the Environmental Protection and Improvement Law, the Forestry Law and the Law of Protected Areas. These laws, all recently issued, are based on the Political Constitution of Guatemala.

The Environmental Protection and Improvement Law (1986) has initiated some legal actions and operations that protect the environment and manage natural resources. The Regulation of the Maximum and Minimum Permissible Contamination for Discharge of Residual Waters is the first regulation of the Environmental Law (Decree No. 60-89). This regulation protects water quality for its different uses: population, agriculture, livestock and industry. The short-term economic impact would be negative due to the cost of treating residual domestic and agro-industrial waters. In the long term, the economic impact would be positive due to the savings in treatment costs and availability of quality water resources. The long-term impact on natural resources would be positive due to the protection and improvement of the water resource.

Also, the Environmental Law has motivated natural resource development projects specifically relating to water resources to focus on watershed management (Chixoy, Atitlan, Xaya-Pixcaya and Amatitlan). In addition, CONAMA has requested that all development projects comply with Article 8 of the law, which requires an environmental impact assessment (EIA).

AGRICULTURAL POLICY ANALYSIS PROJECT, PHASE II

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GUATEMALA NATURAL RESOURCE POLICY INVENTORY USAID/ROCAP RENARM PROJECT

VOLUME III

TECHNICAL APPENDICES

APRIL 1990

TECHNICAL REPORT NO. 108

Conducted Under Contract with Abt Associates Inc. and the Agricultural Policy Analysis Project, Phase II (APAP II)

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VOLUME III
TECHNICAL APPENDICIES

TECHNICAL APPENDIX A: THE GUATEMALA NATURAL RESOURCE POLICY INVENTORY TABLES

INTRODUCTION

This volume presents the Policy Inventory Tables and is divided into four sections by the natural resource categories sustainable agriculture, production from natural forest, watershed management and management of wildlands. A summary table of the policies identified is provided in the beginning of each section. Within each section, the policies are further divided into the categories of fiscal, trade, regulatory and development. These tables are used to support the policy discussions of Chapter IV and V of Volume II.

Each table describes a policy and its objectives, cites the main institution implementing or creating the policy, makes qualitative assessments of its impact on economic growth and the natural resource base in the short- and long-run and briefly explains each assessment, and lists policy alternatives or issues requiring further research. Qualitative assessments are based on the following scale:

-2	significant negative impact
-1	slightly negative impact
0	no impact
+1	slightly positive impact
+2	significant positive impact

Short-term is defined as a period less than two years, and long-term is defined as a period of greater than ten years. Medium-term effects were not analyzed. The assessments were made under ceterus paribus conditions, unless otherwise noted. Often assumptions concerning the implementation of a policy were needed to assess long-run impacts of the policy, and these were incorporated into the brief explanation of each assessment. These tables were made with limited quantitative information and stem from "round table" policy discussions among the team members and other experts.

SUMMARY TABLE

SUSTAINABLE AGRICULTURE

FISCAL:
TAX INCENTIVES FOR DECENTRALIZATION

TRADE:
EXPORT PROMOTION BEEF
EXPORT PROMOTION NON-TRADITIONAL COMMODITIES

REGULATORY:
PROTECTED AREAS LAW
PESTICIDE LAW

DEVELOPMENT:
PETEN COLONIZATION
AGRARIAN TRANSFORMATION LAW

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Sustainable Agriculture**

POLICY CATEGORY: **Fiscal**

POLICY: Tax incentives to decentralize

PURPOSE: Promote industrial activity outside Guatemala metropolitan area through fiscal incentives.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Direccion de Politica Industrial, Ministry of Economy

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Slight positive effect on growth in the industrial sector.

SHORT-RUN NATURAL RESOURCE: Increase competition with agricultural lands and water resources.

LONG-RUN GROWTH: Slight positive effect on growth in the industrial sector.

LONG-RUN NATURAL RESOURCE: Resource management effects may result from increased economic development of rural areas.

ADDITIONAL COMMENTS: Many of the new industries are located in urban areas near Guatemala City; The law requires lengthy studies and new procedures.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study ways to simplify procedures and add environmental assessment component to plans.
- Study and develop guidelines for environmental assessment required by Article 8 of the Environmental Law.
- Study and develop system to enforce Article 8 of the Environmental Law, requiring environmental assessment.
- Study and develop municipal zoning policies in potentially affected areas.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Sustainable Agriculture**

POLICY CATEGORY: **Trade**

POLICY: Beef Export Promotion: relatively lower export taxes for beef (1-1.8%) compared to production substitutes, such as coffee (8-18%) and sugar (7-17%).

PURPOSE: Promote the export of beef

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Bank of Guatemala, Ministry of Finance

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	-1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: High gains from harvesting wood. Allowing a profitable return on land when credit is exhausted and/or risk is high.

SHORT-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils with inappropriate technology causes soil compaction and productivity losses.

LONG-RUN GROWTH: Natural forests and idle lands are converted into cattle pastures of low economic return. Also transfer land use from intensive agricultural production towards extensive livestock production.

LONG-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils with inappropriate technology causes soil compaction and productivity losses.

ADDITIONAL COMMENTS: Effects from this export tax is curtailed because: a small percentage of beef exports enter the formal market; low percentage of producers who pay taxes; other incentives such as quotas on cattle exports have a stronger affect on the domestic price and supply of beef.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study feed lot production of beef for Guatemala and consider policy incentives to promote this technology.
- Empirically estimate the supply response to a change in the export tax before considering changing the beef export tax.
- Study production alternatives that have the same or better short-term economic benefits to the farmer and more positive effects on the natural resource base: i.e., forestry management and production.
- Evaluate levels and types of subsidies if necessary which insure relative profitability for these alternatives.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Sustainable Agriculture**

POLICY CATEGORY: **Trade**

POLICY: Export Promotion: Lower taxes; public sponsoring of marketing and promotion events.

PURPOSE: Promote export of non-traditional products.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAPEX, GEXPRONT, Bank of Guatemala, Ministry of Finance, DIGESA, BANDESA, BANEX, PRODAC

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Positive: transfers production activities to higher short-run profitable activities; gains in foreign exchange.

SHORT-RUN NATURAL RESOURCE: Intensified land use will reduce pressure on land. Intensive tilling, cropping practices and increased pesticide use without controls deteriorates natural resources.

LONG-RUN GROWTH: Long-run economic growth is curtailed for small producers who specialized in a limited number of non-traditional crops whose supply is highly dependent on the international market price and limited demand.

LONG-RUN NATURAL RESOURCE: Intensified land use will reduce pressure on land if population growth is controlled. Intensive tilling, cropping practices and increased pesticide use without controls deteriorates natural resources.

ADDITIONAL COMMENT: This assumes nutrient replacement through fertilization.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Support studies and technical assistance for watershed management: to improve use of pesticides; soil conservation; water management; fertilizer use.
- Study the potential policy conflict with pesticide residual restrictions in importing countries.
- Develop a system to monitor supply and demand trends in relevant international markets.
- Study economic feasibility of tree crops (wood, fruit and spices) to improve long-term natural resource use.
- Study the long-run impact on soils from non-traditional crop production.
- Study current employment trends and alternative employment for small producers.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Sustainable Agriculture**

POLICY CATEGORY: **Regulatory**

POLICY: Protected Areas Law (Article 5c)

PURPOSE: Promote ecosystem protection and sustained resource use

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP, BANDESA, DIGESA, DIGESEPE

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	0	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Colonization and private investment will be reduced because licenses for economic activity will not be issued while by-laws and specific protected areas categories are developed.

SHORT-RUN NATURAL RESOURCE: Strong emphasis on ecosystem and wildlife protection.

LONG-RUN GROWTH: Depends on intent of the law concerning development of sustainable agricultural and forestry management in buffer areas. Ecosystem protection will create opportunities for long-term ecotourism development and other economic activities.

LONG-RUN NATURAL RESOURCE: Strong emphasis on ecosystem and wildlife protection.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Examine ways of incorporating community attitudes, goals and activities into the implementation stage of the law.
- Study economic activities in protected areas to develop culturally and ecologically appropriate long-term use policies.
- Examine successful buffer zones in other countries to develop by-laws and buffer zone categories using a "sustainable management" approach.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Sustainable Agriculture**

POLICY CATEGORY: **Regulatory**

POLICY: Regulating Law on the Importation, Creation, Storage, Transportation, Sale and Use of Pesticides and Regulation

PURPOSE: To regulate these activities in relation to public health, agriculture and livestock.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: MAGA/DIGESA, Ministries of Public Health, Economy and Work, GREPAGRO

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	-1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Proper implementation of the law retards agricultural activities and therefore results in a negative economic impact.

SHORT-RUN NATURAL RESOURCE: By regulating use of residual pesticides contamination of soil, water and environment in general is reduced.

LONG-RUN GROWTH: Proper implementation of the law retards agricultural activities and therefore results in a negative economic impact. This impact could be positive, if integrated pest management is used; more economical and increases productivity. Also, with natural resources in better condition, productivity could increase.

LONG-RUN NATURAL RESOURCE: A positive impact on natural resources will occur due to detoxification. Natural regeneration will improve water supply and soil resources.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Study procedures to improve compliance with this law and regulations.
- Study and apply methods for institutional strengthening including improvement in technical capacity.
- Study and develop alternative and economically feasible pest control methods, such as integrated pest management, organic pesticides.
- Conform regulations to meet international requirements. Establish maximum permissible levels of residuals in foods.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Sustainable Agriculture**
POLICY CATEGORY: **Development**

POLICY: Land colonization and exploration of natural resources in the Peten: promote infrastructure (roads, schools, towns).

PURPOSE: Land exploration and development of the Peten.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: FYDEP, Commission Liquidadora de la Empresa de Fomento y Desarrolo Economico del Peten, created in 1983 to dissolve FYDEP, Consejo Regional de Desarrollo del Peten.

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	-2	-2	-2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Promoted felling of forests to plant basic grains and use for cattle grazing.

SHORT-RUN NATURAL RESOURCE: Development policies of the Peten have not incorporated any resource management strategies. Without formal title to land, farmers do not investment in resource management.

LONG-RUN GROWTH: Initial agricultural production cannot be maintained due to the rapid loss in soil fertility.

LONG-RUN NATURAL RESOURCE: Development policies of the Peten have not incorporated any resource management strategies. Without formal title to land, farmers do not investment in resource management.

ADDITIONAL COMMENT: Economic growth generated by the exploration of forest products benefitted foreign companies and Guatemalan special interest groups.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study ways to strengthen institutions (DIGEBOS, CONAP, DIGESA, ICTA, INTA, BANDESA) administering resources in the Peten.
- Study alternative development options to agricultural production in accordance with the natural resources of Peten: sustained forest management; agroforestry systems; sustained production of non-wood forest products.
- Develop ways to promote agricultural production techniques that are sustainable for Peten's soils.
- Assess the political power structure in the Peten and identify constraints to policy implementation.
- Assess the policy implications of the current limited physical access to the Peten.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Sustainable Agriculture**

POLICY CATEGORY: **Development**

POLICY: Agrarian Transformation Law

PURPOSE: Exploit uncultivated lands and sell lands to small farmers.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: INTA, BANDESA, DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-2	-1	-2

BRIEF EXPLANATION OF POLICY IMPACT;

SHORT-RUN GROWTH: By making lands available to private sector, agricultural and forestry (lumber and firewood) production increases in the short run.

SHORT-RUN NATURAL RESOURCE: Soil productivity rapidly drops when forest soils are colonized, particularly in the Franja Transversal, Izabal and Peten regions.

LONG-RUN GROWTH: Long-term economic growth can occur from exploiting rich southern coastal soils; long-term benefits curtailed if land is unsuited for agriculture.

LONG-RUN NATURAL RESOURCE: These farmers eventually sell their land because they lack management capability, thus concentrating land ownership over time.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study other sustainable development options: forestry, agroforestry, fisheries.
- Design program systems that will improve farmers' management capabilities.

SUMMARY TABLE
PRODUCTION FROM NATURAL FORESTS

FISCAL:
STUMPAGE TAX
FISCAL INCENTIVES: FORESTRY LAW

TRADE:
EXPORT PROMOTION OF BEEF
TIMBER EXPORT RESTRICTIONS
EXPORT PROMOTION OF NON-TRADITIONAL COMMODITIES

REGULATORY:
PROTECTED AREAS LAW
FORESTRY LAW:
- CONCESSION AND MANAGEMENT PLANS
- DOMESTIC USE OF FORESTRY PRODUCTS
- FINES FOR VIOLATIONS
- LICENSING TRANSPORTATION
- REGULATE CHANGE IN LAND USE

DEVELOPMENT:
PETEN COLONIZATION
AGRARIAN TRANSFORMATION LAW
PRIVATE SECTOR REFORESTATION
AGRO FORESTRY MANAGEMENT PROJECTS
REFORESTATION PROGRAMS
10% FORESTED LAND: FORESTRY LAW

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Fiscal**

POLICY: Stumpage Tax, fixed based on standing wood value for natural forests (Forestry Law Article 94).

PURPOSE: Collect revenue for DIGEBOS Forest Fund and government capture of economic rent from forest

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Added additional cost to timber production may retard growth.

SHORT-RUN NATURAL RESOURCE: Pre-cutting tax will discourage short-term mining when forest has low value. Protects ecosystems with low economic value.

LONG-RUN GROWTH: Positive if funds generated are used by DIGEBOS to implement long-run forest management policies.

LONG-RUN NATURAL RESOURCE: Will increase economic value of forests by assigning monetary value to all parts of the tree and not just the components used by the forest industry. Results in better allocation of forest resources in the long term if appropriate field implementation and expertise is applied.

ADDITIONAL COMMENT: DIGEBOS may encourage extraction because of self-interest in generating revenues.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Studies ways to determine and update "base forest values."
- Examine fiscal importance of the program for DIGEBOS and alternative forms of financing.
- Study means of reinvesting the tax revenue into long-run sustainability of the forests.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Fiscal**

POLICY: Fiscal Incentives in Forestry Law (Articles 83-89): approved forestation or reforestation project receive a 50% income tax reduction and 100% land tax exemption for four years.

PURPOSE: Increase forest cover

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, Ministry of Finance

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
0	2	1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: No significant impact.

SHORT-RUN NATURAL RESOURCE: Increasing forests cover benefits the soils, underbrush and wildlife.

LONG-RUN GROWTH: Improves conditions for long-run sustainability of timber industry.

LONG-RUN NATURAL RESOURCE: Improves conditions for long-run sustainability of forest resources.

ADDITIONAL COMMENTS: Exemption from land tax is ineffective incentive because these taxes are not collected. Incentives provided by reduction in income tax are stronger; Policy favors large investors; DIGEBOS may influence incentives through cost estimates.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study welfare distribution effects from policy.
- Study policy impact on government revenue.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Trade**

POLICY: Beef Export Promotion: relatively lower export taxes for beef (1-1.8%) compared to production substitutes, such as coffee (8-18%) and sugar (7-17%).

PURPOSE: Promote the export of beef

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Bank of Guatemala, Ministry of Finance

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	-1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: High gains from: harvesting wood; allowing a profitable return on land when credit is exhausted and/or risk is high.

SHORT-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils causes compaction and soil productivity losses.

LONG-RUN GROWTH: Natural forests and idle lands are converted into cattle pastures of low economic return.

LONG-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils causes compaction and soil productivity losses.

ADDITIONAL COMMENTS: Effects from this export tax is curtailed because: a small percentage of beef exports enter the formal market; low percentage of producers who pay taxes; other incentives such as quotas on cattle exports have a stronger affect on the domestic price and supply of beef. This policy has welfare distributional effects: supporting the high concentration of wealth in the cattle industry.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study feed lot production of beef for Guatemala and consider policy incentives to promote this technology.
- Empirically estimate the supply response to a change in the export tax before considering changing the beef export tax.
- Study production alternatives that have the same or better short-term economic benefits to the farmer and more positive effects on the natural resource base: i.e., forestry management and production.
- Evaluate the level and method of subsidies if necessary which insure relative profitability for these alternatives.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Trade**

POLICY: Restrictions on Log and Timber Exports (Forestry Law, Article 69)

PURPOSE: Develop secondary timber markets to promote the industrialization of the timber industry.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS; Customs

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Retards production in short-run until the industry can enter into the international market for processed woods.

SHORT-RUN NATURAL RESOURCE: Reduction in growth of timber production conserves forests.

LONG-RUN GROWTH: Depends on long-term efficiency and comparative advantage of secondary wood product production with respect to the world market.

LONG-RUN NATURAL RESOURCE: Slightly positive because the value added to the timber provides incentives for the timber industry to better manage the forests.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Promote the creation of technical assistance program: from training technical personnel to implementation.
- Provide specific credits, technical assistance and training for adopting technologies needed to enter into export markets.
- Conduct analysis of Guatemala's comparative advantage in wood products with respect to other world market suppliers.
- Define policies and strategies for developing the wood products industry. For example, timing of the release of subsidies based on infant industry arguments.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Trade**

POLICY: Export Promotion of Non-Traditional Commodities: Lower taxes; public sponsoring of marketing and promotion events.

PURPOSE: Promote export of non-traditional products.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAPEX, GEXPRONT, Bank of Guatemala, Ministry of Finance, Ministry of Agriculture, BANEX, PRODAC

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	2	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Positive: transfers production activities to higher short-run profitable activities; gains in foreign exchange.

SHORT-RUN NATURAL RESOURCE: Intensified land use will reduce pressure on land.

LONG-RUN GROWTH: Provides economic incentives for forest products, i.e., furniture.

LONG-RUN NATURAL RESOURCE: Intensified land use will reduce pressure on land if population growth is controlled.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study economic feasibility of tree crops (wood, fruit and spices) to improve long-term natural resource use.
- Develop monitoring and dissemination system of external supply and demand trends for wood products in relevant international markets.
- Develop means necessary to provide technical assistance to raise product quality to international standards.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Regulatory**

POLICY: Declaration of Protected Areas (Protected Areas Law)

PURPOSE: Restore, protect, conserve and manage the country's natural and national heritage

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-2	1	1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Economic growth is directly restricted if the law is strictly applied. Scope of impact is large: 50 areas are designated protected.

SHORT-RUN NATURAL RESOURCE: Protects biodiversity. Scope of impact is large: 50 areas are designated protected.

LONG-RUN GROWTH: Long-term economic benefits depend on whether the country capitalizes on ecotourism and protected areas are optimally managed.

LONG-RUN NATURAL RESOURCE: Protects biodiversity. Benefits depend on local support and acceptance and on the stability of funding.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study grass roots approaches to support the law.
- Consider prioritizing management of areas with: known endemisms including migratory species; strong ecotourism potential; limited forestry and agricultural value; low population pressures; wetlands of international importance.
- Evaluate effectiveness and efficiency of institutions involved and make recommendations for improvement.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Regulatory**

POLICY: Approve and Monitor Forest Management Plans and Grant Concessions (Forestry Law, Articles 7-9, 11, 13, 16)

PURPOSE: Optimize forest resource management

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, CONAMA, SIGAP/CONAP

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	2	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Forest owners must postpone cutting and forego revenues in short-term.

SHORT-RUN NATURAL RESOURCE: Forest owners must postpone cutting, protecting the forests in the short-run.

LONG-RUN GROWTH: Promotes long-run sustainability of the timber industry.

LONG-RUN NATURAL RESOURCE: Benefits depend upon the quality of reforestation component of management plans. Ten year concession will not lead to optimal resource management given much longer tree rotations in some regions.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study ways to support and fund DIGEBOS, including developing training programs for the staff to evaluate management plans.
- Study the coordination among the institutions mandated to implement these components of the law.
- Define terms of reference for management plans.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Regulatory**

POLICY: Domestic use of Forest Products: firewood, fences, rural housing and construction (Forestry Law, Article 46-47)

PURPOSE: Exempt domestic consumption of forest products from license requirements on owner and community property

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Savings from expenditures for these materials results in a positive economic impact.

SHORT-RUN NATURAL RESOURCE: Policy implies the land owner will need to manage forest resources and will require better technical assistance to do so.

LONG-RUN GROWTH: Savings from expenditures for these materials results in a positive economic impact.

LONG-RUN NATURAL RESOURCE: May change the farmers attitude about forests; to include other uses besides firewood.

ADDITIONAL COMMENT: Implementation of license requirements for individually private lands is difficult. Exemption from license requirement might not have a significant impact compared with the scenario of no exemption.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Develop alternative forest uses and incentive mechanisms for these uses.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Regulatory**

POLICY: Fines and penalties for violation of Forestry Law (Articles 98-99).

PURPOSE: Penalize forest violations and misdemeanors

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, Judicial System

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	-2	-2

BRIEF EXPLANATION OF POLICY IMPACT:

Illegal extraction of forest products is not curtailed because most of the fines and penalties are inadequate for effective enforcement; DIGEBOS lacks the personnel to supervise and enforce the law; there is no avenue within the judicial system to coordinate with DIGEBOS in enforcing the law.

Key exemption: There is one penalty that is potentially effective. Once a license is revoked, a firm cannot receive any other license. Even if the company changes its name, the land in which the license was revoked will have already been allocated to a different company.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study the penalty system and recommend alternatives to maintain the fines values' over time.
- Review relationship between DIGEBOS and the judicial system and recommend better enforcement procedures.
- Improve DIGEBOS field personnel, quantity and quality, for effective enforcement.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Regulatory**

POLICY: Licensing Transportation of Forest Products (Forestry Law, Article 65)

PURPOSE: Control forest product extraction and transportation

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, Judicial System, Customs Police (Guardia de Hacienda)

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
0	0	0	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Fines are considered too small in relation to forest product value.

SHORT-RUN NATURAL RESOURCE: Fines are considered too small in relation to forest product value.

LONG-RUN GROWTH: Fines are considered too small in relation to forest product value.

LONG-RUN NATURAL RESOURCE: If enforced, policy could have a marginal positive impact in the long-run because it provides a mechanism to gather information on the quantity and location of forest production.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study penalty system and recommend alternatives to maintain the value of the fine over time.
- Improve DIGEBOS field personnel, connoted and quality, and recommend better enforcement procedures.
- Review relationship between DIGEBOS and Judicial system.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Regulatory**

POLICY: Regulate the change in use of private lands covered by forests (Forestry Law, Article 41)

PURPOSE: To conserve forest cover.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, Councils of Urban and Rural Development

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Discourages use of the land for agriculture and livestock production which retards economic growth and preserves the forests.

SHORT-RUN NATURAL RESOURCE: Discourages use of the land for agriculture and livestock production which retards economic growth and preserves the forests.

LONG-RUN GROWTH: Benefits are restrained by the degree of enforcement of this law.

LONG-RUN NATURAL RESOURCE: Benefits curtailed because of the given relative inefficiency of reforestation programs and the potential misuse of funds.

ADDITIONAL COMMENTS: Most land in Guatemala appropriate for agricultural production is already cleared of forests.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Develop alternative incentives to maintain forest cover
- Examine the implementation system between DIGEBOS, DIGESA and the Consejo de Desarrollo using the potential land use information.
- Study and develop a system to ensure that funds collected are used exclusively for reforestation.
- Emphasize reforestation by using local species with high economic value and/or maintain soil cover.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Development**

POLICY: Land colonization and exploration of natural resources in the Peten: promote infrastructure (roads, schools, towns).

PURPOSE: Land exploration and development of the Peten.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: FYDEP and the Commission Liquidadora de la Empresa de Fomento y Desarrolo Economico del Peten, created in 1988 to dissolve FYDEP, Consejo Regional de Desarrollo del Peten.

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
2	-1	-1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Promoted felling of forests to plant basic grains and use for cattle grazing.

SHORT-RUN NATURAL RESOURCE: Deterioration and loss of forest and wildlife resources is due to the promotion of extractive forest products without using appropriate techniques.

LONG-RUN GROWTH: Initial agricultural production cannot be maintained due to the rapid loss in soil fertility.

LONG-RUN NATURAL RESOURCE: Deterioration and loss of forest and wildlife resources is due to the promotion of extractive forest products without using appropriate techniques.

ADDITIONAL COMMENT: Economic growth generated by the exploration of forest products benefitted foreign companies and Guatemalan special interest groups.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study ways to strengthen institutions (DIGEBOS, CONAP, DIGESA, ICTA, INTA, BANDESA) administering resources in the Peten.
- Study alternative development options to agricultural production in accordance with the natural resources of Peten: sustained forest management; agroforestry systems; sustained production of non-wood forest products.
- Assess the political power structure in the Peten and identify constraints to policy implementation.
- Assess the policy implications of Peten's limited physical access.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Development**

POLICY: Agrarian Transformation Law

PURPOSE: Exploit uncultivated lands and sell lands to small farmers.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: INTA, BANDESA, DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-2	-2	-2

BRIEF EXPLANATION OF POLICY IMPACT;

SHORT-RUN GROWTH: By making lands available to private sector, agricultural and forestry (lumber and firewood) production increases in the short run.

SHORT-RUN NATURAL RESOURCE: The possibility of establishing forest plantations in areas without forests, whose soils are appropriate for forestry is omitted.

LONG-RUN GROWTH: Long-term economic growth can occur from exploiting rich southern coastal soils; long-term benefits curtailed if land is unsuited for agriculture.

LONG-RUN NATURAL RESOURCE: Long-run benefit to natural resource is destroyed if land is unsuited for agriculture.

Farmers' benefitted sell their land because they lack management capability, thus concentrating land ownership over time.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study other sustainable development options: forestry, agroforestry, fisheries.
- Design program systems that will improve farmers' management capabilities.
- Evaluate land tenure and use in Peten to develop new polices for distributing lands.
- Develop monitoring system to insure INTA's compliance with the law in the Peten.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Development**

POLICY: Forestry Law: private sector reforestation provisions (Articles 72, 74, 76, 80); general provisions for small-scale incentives.

PURPOSE: Promote reforestation

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
0	0	1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Slightly negative because reforestation projects have initial costs without immediate benefits.

SHORT-RUN NATURAL RESOURCE: Insignificant because natural resource benefits from reforestation are only in the long-run.

LONG-RUN GROWTH: Benefits from sustainable forest development are generally positive.

LONG-RUN NATURAL RESOURCE: Private sector role viewed as improvement in efficiency compared to public sector reforestation efforts.

ADDITIONAL COMMENTS: Effectiveness will depend on: small land holder access to DIGEBOS; availability of trees at DIGEBOS (as Luis!!!); quantity and quality of technical support; effectiveness of enforcement by DIGEBOS.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Examine DIGEBOS institutional capacity.
- Study involvement of private sector and environmental activist groups.
- Evaluate cost recovery.
- Study 3 year security bond system and export cost incentives for small land holders to determine effectiveness and recommend changes if needed.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Development**

POLICY: Agroforestry Management Projects

PURPOSE: Develop and promote agroforestry systems on small farms in the Highlands and western region for soil conservation, extraction of wood, improving ecosystem diversity.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, CARE, Peace Corps

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
0	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Insignificant: limited in scope to approximately 1500 hectares.

SHORT-RUN NATURAL RESOURCE: Insignificant because substantial changes in resource management take a long time.

LONG-RUN GROWTH: Positive, from higher crop yields and improved agroforestry system.

LONG-RUN NATURAL RESOURCE: Positive: higher crop yields and improved agroforestry system is beneficial to resource base.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study size of region and targeted farm size in project design to expand scope.
- Introducing cash tree crops into agroforestry system should be explored.
- Expand program to train rural population in different uses of forest products: handicrafts, carpentry and construction.
- Develop periodic evaluation system for projects to ensure benefits are continuing.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Development**

POLICY: Massive Reforestation Project for the Northeast

PURPOSE: Restore productive forest cover in critical areas including the CELGUSA zone of influence.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, CORFINA

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Slightly negative because reforestation projects have initial costs without immediate benefits.

SHORT-RUN NATURAL RESOURCE: Insignificant because natural resource benefits from reforestation are only in the long-run.

LONG-RUN GROWTH: Concentration of efforts in zone of high export potential will have positive economic gains in the long-run.

LONG-RUN NATURAL RESOURCE: Strong economic gains would provide incentive to expand from the 5000 hectares planned for reforestation. Long-run gains limited by site quality in some of the designated areas.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study issues associated with expanding area beyond 5000 hectares, i.e., using faster growing strains.
- Study ways to improve the operational aspects of the projects.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Production from Natural Forests**

POLICY CATEGORY: **Development**

POLICY: Land Use: 10% of government agrarian development lands and all new urban areas must be forested. (Forestry Law, Articles 71, 73, 74, 38; also referred to in the Agrarian Transformation Law)

PURPOSE: To establish minimum forested areas in colonization projects.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, INTA

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	0	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Negative because developers are prohibited from obtaining immediate economic benefits from 10% of the area.

SHORT-RUN NATURAL RESOURCE: Benefits from preserving some of the original habitat. Under the Forestry Law, DIGEBOS determines soil production capacity before land is awarded.

LONG-RUN GROWTH: No significant effects because the least productive lands are allocated to forest cover.

LONG-RUN NATURAL RESOURCE: Benefits from preserving some of the original habitat. Under the Forestry Law, DIGEBOS determines soil production capacity before land is awarded.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Develop strategies for designing forest zones that maximize benefits.
- Examine incentives to promote forestry management of these lands.
- Examine institutional capacity of DIGEBOS to determine appropriate land uses.

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SUMMARY TABLE

WATERSHED MANAGEMENT

FISCAL:
TAX INCENTIVES FOR DECENTRALIZATION

TRADE:
EXPORT PROMOTION OF BEEF
EXPORT PROMOTION OF NON-TRADITIONAL COMMODITIES

REGULATORY:
MANAGEMENT OF MANGROVES
PROTECT FORESTS IN WATERSHEDS
RESERVE AREAS LAW
PESTICIDE LAW
EFFLUENT WATERS LAW
HEALTH AND MUNICIPAL CODES
PROPOSED WATER LAW
PROTECTED AREAS AND HUNTING LAWS
ENVIRONMENTAL LAW
MINING CODE
WATER USE PERMITS
HYDROCARBONS LAW

DEVELOPMENT:
HYDROELECTRIC INVESTMENT
COLONIZATION
PUBLIC ACCESS TO WATER SUPPLY

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Fiscal**

POLICY: Tax incentives for decentralization

PURPOSE: Promote industrial activity outside Guatemala metropolitan area through fiscal incentives.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Direccion de Politica Industrial, Ministry of Economy

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Slight positive effect on growth in the industrial sector.

SHORT-RUN NATURAL RESOURCE: Increase competition with agricultural lands and water resources.

LONG-RUN GROWTH: Slight positive effect on growth in the industrial sector.

LONG-RUN NATURAL RESOURCE: Resource management effects may result from increased economic development of rural areas. Strong negative impact on natural resources through industrial contamination of water and soils.

ADDITIONAL COMMENTS: Many of the new industries are located in urban areas near Guatemala City; The law requires lengthy studies and new procedures.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study simplification of procedures and adding environmental assessment component.
- Study and develop guidelines for environmental assessment required and monitored by CONAMA.
- Study and develop system to enforce Article 8 of the Environmental Law, requiring environmental assessment.
- Study and develop municipal zoning policies in potentially affected areas.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Trade**

POLICY: Beef Export Promotion: relatively lower export taxes for beef (1-1.8%) compared to production substitutes, such as coffee (8-18%) and sugar (7-17%).

PURPOSE: Promote the export of beef

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Bank of Guatemala, Ministry of Finance

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	-1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: High gains from: harvesting wood; allowing a profitable return on land when credit is exhausted and/or risk is high.

SHORT-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils causes compaction and soil productivity losses.

LONG-RUN GROWTH: Natural forests and idle lands are converted into cattle pastures of low economic return.

LONG-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils causes compaction and soil productivity losses.

ADDITIONAL COMMENTS: Effects from this export tax is curtailed because: a small percentage of beef exports enter the formal market; low percentage of producers who pay taxes; other incentives such as quotas on cattle exports have a stronger affect on the domestic price and supply of beef. This policy has welfare distributional effects: supporting the high concentration of wealth in the cattle industry.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study feed lot production of beef for Guatemala and consider policy incentives to promote this technology.
- Empirically estimate the supply response to a change in the export tax before considering changing the beef export tax.
- Study production alternatives that have the same or better short-term economic benefits to the farmer and more positive effects on the natural resource base: i.e., forestry management and production.
- Evaluate the level and method of subsidies if necessary which insure relative profitability for these alternatives.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Trade**

POLICY: Export Promotion: Lower taxes; public sponsoring of marketing and promotion events.

PURPOSE: Promote export of non-traditional products.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAPEX, GEXPRONT, Bank of Guatemala, Ministry of Finance, Ministry of Agriculture, BANEX

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Positive: transfers production activities to higher short-run profitable activities; gains in foreign exchange.

SHORT-RUN NATURAL RESOURCE: Intensified land use will reduce pressure on land.

LONG-RUN GROWTH: Provides economic incentives for forest products, i.e., furniture.

LONG-RUN NATURAL RESOURCE: Intensified land use will reduce pressure on land if population growth is controlled.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Support studies and technical assistance for watershed management: improves pesticide use; soil conservation; water management; fertilizer use.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Management of Mangroves: Forestry Law, Article 21

PURPOSE: Protect mangroves

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Production of by-products of mangroves: salt, charcoal and shrimp is restricted, resulting in short-run economic losses.

SHORT-RUN NATURAL RESOURCE: Benefits are minimal because there are limited substitutes for products of mangroves.

LONG-RUN GROWTH: Long-run benefits from the mangrove ecosystem translate into economic benefits.

LONG-RUN NATURAL RESOURCE: Benefits of protecting the mangroves are somewhat positive, although prohibition of small scale charcoal production can not be effectively enforced.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Design effective management schemes that ensure economic value of the mangrove is not ignored.
- Study incentive systems, including factors of cultural traditions related to the present mangrove production systems, and alternative forms of management of the mangroves.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Special protection for forests in critical watersheds

PURPOSE: Protect watersheds

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Farmers' capacity to cultivate and extract wood is reduced.

SHORT-RUN NATURAL RESOURCE: Farmers' capacity to cultivate and extract wood is not significant enough to impact the resource base in the short run.

LONG-RUN GROWTH: Economic benefit from improved water and soil quality and quantity.

LONG-RUN NATURAL RESOURCE: Improvement in watersheds will exist only in the long run. Adequate forest watershed management will guarantee long term natural resource benefits.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Examine institutional linkages with CONAMCUEN.
- The policy is not specific. Examine policy alternatives for regulatory design phase.
- Develop the "special protection" system and identify critical watersheds.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Reserve Areas Law Based on: Article 64 of Constitution. Established ocean shore of 150 meters, lake and riverbanks and head waters as reserved areas. Issues 35-year leases at less than Q100 for private use of the areas.

PURPOSE: Maintain government domain over water fronts.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: OCREN

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	-1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Creates economic uncertainty of land rights.

SHORT-RUN NATURAL RESOURCE: No impact because on waterfronts, homes have been built on the border of the rivers and oceans.

LONG-RUN GROWTH: Creates economic uncertainty of land rights.

LONG-RUN NATURAL RESOURCE: In the very long run, waterfronts could be protected.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

o Study the lease system and its impact:

a) What percentage of reserve areas are leased to private sector?

b) What percentage of "free" areas are actually occupied by squatters?

c) On average, how many hectares are distributed for each lease?

d) What are the main economic activities in these areas: mangrove extraction, shrimp farms, salt production, cotton, wildlife extraction (turtles).

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Regulating Law on the Importation, Production, Storage, Transportation, Sale and Use of Pesticides and Regulation

PURPOSE: To regulate these activities in relation to public health, agriculture and livestock.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: MAGA/DIGESA, Ministries of Public Health, Economy and Work, GREPAGRO

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	-1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Proper implementation of the law retards agricultural activities and therefore results in a negative economic impact.

SHORT-RUN NATURAL RESOURCE: By regulating use of residual pesticides contamination of soil, water and environment in general is reduced.

LONG-RUN GROWTH: Proper implementation of the law retards agricultural activities and therefore results in a negative economic impact. This impact could be positive, if integrated pest management is used; more economical and increases productivity. Also, with natural resources in better condition, productivity could increase.

LONG-RUN NATURAL RESOURCE: A positive impact on natural resources will occur due to detoxification and natural regeneration will improve water supply.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Study application procedures to improve compliance with this law and regulations.
- Study and apply methods for institutional strengthening including improvement in technical capacity.
- Study and develop alternative pest control methods, such as integrated pest management, organic pesticides, etc.
- Study regulation to make it meet international requirements and establish maximum permissible levels of residuals in foods.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Effluent Waters Law: Regulation of the Maximum Permissible Contamination for Discharge of Residual Waters, Decree No. 60-89

PURPOSE: Protects water quality for population and agricultural, livestock and industrial uses.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAMA, ICAITI, Ministry of Public Health, Universities

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	-1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: The economic impact would be negative due to the cost of treating residual domestic and agro-industrial waters.

SHORT-RUN NATURAL RESOURCE: This would be negative due to the contamination of water resources by residual waters and the time needed to implement treatment and control systems.

LONG-RUN GROWTH: Savings in treatment costs and availability of quality water resources would result in a positive economic impact.

LONG-RUN NATURAL RESOURCE: The resultant protection and improvement of water resources would have a positive impact on natural resources.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Support government efforts to monitor and enforce quality standards.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Political Constitution of Guatemala (Art. 93, 94, 95, 96, 98 & 99)
- Health Code (Art. 18, 19 & 43)
- Municipal Codes and Regulations (Art. 70)

PURPOSE: Protect and improve public health and the environment.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Ministry of Public Health and Social Assistance through Division de Saneamiento del Medio.

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Real impact is negative due to initial investment for protecting and improving public health, through purchase of equipment and public health programs, etc. and possible gains in work productivity are not immediate.

SHORT-RUN NATURAL RESOURCE: Impact is small due to time needed to implement health and sanitation programs (i.e., cleaning up communal dump sites) and for contaminated waters to recover.

LONG-RUN GROWTH: Growth is positive due to increase in work productivity and savings from purchase of medicines and lower medical bills; less chemicals needed for treatment of drinking water.

LONG-RUN NATURAL RESOURCE: Gains due to natural regeneration of natural resources because of reduction of pollution and contamination.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- o Study appropriate technology for improving water quality.
- o Promote coordination between all institutions that monitor and regulate water resources.
- o Study ways to encourage local participation in health programs.
- o Expand health programs.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Proposed Water Law

PURPOSE: To unify legislation for control and conservation of water resources.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Has not been determined.

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Initial implementation of this policy would have a negative economic impact due to implementation of better water use controls.

SHORT-RUN NATURAL RESOURCE: Uncontrolled use of water resources would be checked and thereby would protect and conserve natural resources.

LONG-RUN GROWTH: Compliance and greater availability of quality water resources will have a positive economic impact for all water use sectors.

LONG-RUN NATURAL RESOURCE: Centralized control will allow the regeneration and conservation of water resources and therefore has a positive impact on natural resources.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Study and determine which authority will have the responsibility for implementing this proposed law, taking into consideration the coordination that will be required of all water use sectors.
- Issue water law.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Political Constitution of Guatemala (Art. 64)
- Protected Areas Law 63-89
- Hunting Law (Art. 11)

PURPOSE: Protect natural heritage, ecosystems and wildlife

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Negative impact on economic growth due to reduction of possible exploitation of these areas for agriculture, livestock or forestry uses.

SHORT-RUN NATURAL RESOURCE: Impact will be small due to time required for natural resource regeneration.

LONG-RUN GROWTH: Slightly positive, supports the tourism industry.

LONG-RUN NATURAL RESOURCE: Natural resources gains due to management of protected areas.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study simplification procedures of site management including zoning; recreation, forest and monument areas.
- Promote and support institutional strengthening programs.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Political Constitution of Guatemala (Art. 97)
Environmental Law, Dec. 68-96

PURPOSE: Protect and improve the environment.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAMA

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Would be negative due to initial investment in control methods, treatment and clean up of contaminated areas. Also would negatively affect economic development due to regulation of activities that affect the environment.

SHORT-RUN NATURAL RESOURCE: Impact would be small due because CONAMA lacks the institutional strength in personnel and funding to enforce the law.

LONG-RUN GROWTH: Economic growth is positive due to savings on treatment and cleanup costs and availability of resources.

LONG-RUN NATURAL RESOURCE: Natural resource impact is positive due to protection and improvement of the environment.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- o Develop regulations for implementing law that are easily applied.
- o Study and develop effective guidelines for environmental assessments.
- o Promote and support institutional strengthening.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Political Constitution of Guatemala (Art. 125)
Mining Code (Art. 62)

PURPOSE: Control exploitation of mines.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Ministry of Energy, Mines and Hydrocarbons - General Directorate of Mines

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	1	0

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Economic impact would be positive due to exploitation of mines. This impact could be reduced by effect of regulation.

SHORT-RUN NATURAL RESOURCE: Impact is negative due to exploitation techniques and dumping of wastes.

LONG-RUN GROWTH: Economic impact would be positive due to exploitation of mines. This impact could be reduced by effect of regulation.

LONG-RUN NATURAL RESOURCE: Impact could be negative due to exploitation techniques and dumping of wastes. Resources could improve if Environmental Law and other regulations are applied.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- o Develop effective mining regulations that are easily applied.
- o Recommend appropriate mining technology.
- o Study and develop effective guidelines for environmental impact assessments.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Political Constitution of Guatemala (Art. 127 & 128)

PURPOSE: Permits for water use.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIRYA

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Impact is negative due to non-approval of permits or invalidating previously issued permits.

SHORT-RUN NATURAL RESOURCE: Impact would be small due because DIRYA lacks the institutional strength in personnel and funding to enforce the law.

LONG-RUN GROWTH: Impact positive due to better allocation and more efficient use of resource.

LONG-RUN NATURAL RESOURCE: Impact positive due to better allocation and more efficient use of resource.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- o Issue water law.
- o Develop a master plan for water resource.
- o Promote institutional coordination.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Regulatory**

POLICY: Hydrocarbons Law (Art. 4 & 41)

PURPOSE: Study, supervise and control exploration, exploitation, transformation and commercialization of petroleum.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Ministry of Energy, Mines and Hydrocarbons - General Directorate of Hydrocarbons

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
0	0	1	0

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Economic growth is small due to regulatory controls.

SHORT-RUN NATURAL RESOURCE: Regulatory controls help keep impact on natural resources at a relatively low level.

LONG-RUN GROWTH: Economic growth is due to exploitation of hydrocarbons under regulatory controls.

LONG-RUN NATURAL RESOURCE: Impact on natural resources may be zero if mitigative measures are taken.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- o Study simplification of procedures and adding environmental impact assessment.
- o Enforce Art. 3 of Environmental Law (Dec. 68-86), which requires EIA.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Development**

POLICY: Political Constitution of Guatemala (Art. 129)

PURPOSE: - Develop hydroelectric projects and coordination of a Master Plan.
- Provide energy.
- Protect and conserve water resources.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: INDE

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	0	2	0

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Economic growth may be positive due to production of energy.

SHORT-RUN NATURAL RESOURCE: Impact would depend on watershed management. Past experiences have indicated strong negative effects.

LONG-RUN GROWTH: Economic growth is positive due to production of energy.

LONG-RUN NATURAL RESOURCE: Impact would depend on watershed management. Past experiences have indicated strong negative effects.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Develop watershed management plans for future projects (including EIA, required by Environmental Law).
- Institutional strengthening of INDE.
- Promote coordination with other water users.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Development**

POLICY: Political Constitution of Guatemala (Art. 67 & 68)
- Agrarian Transformation Law (Art. 12 & 14)

PURPOSE: - Provide and protect lands of small farmers and indigenous cooperatives.

- Colonize the Franja Transversal del Norte.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: INTA

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	-1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Economic growth will be positive due to exploitation of natural resources and agricultural production.

SHORT-RUN NATURAL RESOURCE: Impact will be negative due to poorly managed exploitation of natural resources.

LONG-RUN GROWTH: Will be negative if sustainable agriculture, livestock and forest management are not developed.

LONG-RUN NATURAL RESOURCE: Impact will be negative due to poorly managed exploitation of natural resources.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- o Study the use of appropriate crops and trees with high economic value (i.e., sustainable agriculture, forest management).
- o Conduct studies on the development and use of appropriate technologies that would increase the agricultural productivity and the sustainable uses of the natural resources, especially water and soils.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Watershed Management**

POLICY CATEGORY: **Development**

POLICY: Political Constitution of Guatemala (Art. 93, 94, 95, 96, 98, 99 & 257)
- Health Code (Art. 18, 19 & 43)
- Municipal Codes and Regulations (Art. 70)
- Regulation of Waste Waters Decree 60-89

PURPOSE: Protect and improve public water supply and reduce contamination.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: UNEPAR, Direccion de Desarrollo de la Comunidad, INFOM and EMPAGUA

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Real impact is negative due to initial investment for protecting and improving water supply, through purchase of equipment and implementation of programs.

SHORT-RUN NATURAL RESOURCE: Impact is small due to time needed to implement water and sanitation programs (i.e., cleaning up communal dump sites) and for contaminated waters to recover.

LONG-RUN GROWTH: Growth is positive due to increase in work productivity and savings from purchase of medicines and lower medical bills; less chemicals needed for treatment of drinking water.

LONG-RUN NATURAL RESOURCE: Gains due to conservation and improvement natural resources and wildlife because of reduction of pollution and contamination.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study appropriate technology for improving water quality.
- Promote coordination between all institutions that monitor and regulate water resources.
- Study ways to encourage local participation in health programs.
- Expand water supply and sanitation programs.
- Issue a law regulating water uses.

SUMMARY TABLE

MANAGEMENT OF WILDLANDS

FISCAL:
TAX INCENTIVES FOR DECENTRALIZATION
INCOME TAX EXEMPTIONS

TRADE:
EXPORT PROMOTION OF BEEF
EXPORT PROMOTION OF NON-TRADITIONAL COMMODITIES
INTERNATIONAL COVENANTS ON ENDANGERED WILDLIFE
EXPORT RESTRICTION ON TRADE OF WILDLIFE

REGULATORY:
PROTECTED AREAS LAW
RESERVE AREAS AND AGRARIAN TRANSFORMATION LAWS
HUNTING LAW
ENDANGERED TREE SPECIES
REGULATION OF ENDANGERED SPECIES
PROTECTION OF CULTURAL HERITAGE

DEVELOPMENT:
LAND COLONIZATION (FYDEP)
AGRARIAN TRANSFORMATION LAW
TOURISM LAW

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Fiscal**

POLICY: Tax incentives for decentralization

PURPOSE: Promote industrial activity outside Guatemala metropolitan area through fiscal incentives.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Direccion de Politica Industrial, Ministry of Economy

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH:

SHORT-RUN NATURAL RESOURCE: Increase competition with agricultural lands and water resources.

LONG-RUN GROWTH:

LONG-RUN NATURAL RESOURCE: Resource management effects may result form increased economic development of rural areas.

ADDITIONAL COMMENTS: Many of the new industries are located in urban areas near Guatemala City; The law requires lengthy studies and new procedures.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study simplification of procedures and adding environmental assessment component.
- Study and develop guidelines for environmental assessment required and monitored by CONAMA.
- Study and develop system to enforce Article 8 of the Environmental Law, requiring environmental assessment.
- Study and develop municipal zoning policies in potentially affected areas.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Fiscal**

POLICY: Fiscal Incentives: exemptions from territorial and income taxes; Protected Areas Law (Art. 31 & 32)

PURPOSE: Promotes the conversion of private property into natural reserves and individual activities that receive any income for researching, promoting or developing protected areas.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Economic benefits may be positive for the owners or interested parties that are dedicated to protected areas.

SHORT-RUN NATURAL RESOURCE: Impact will be positive due to the conservation of natural areas but will depend on the number of persons involved in these activities.

LONG-RUN GROWTH: Economic benefits may be positive for the owners or interested parties that are dedicated to protected areas.

LONG-RUN NATURAL RESOURCE: Impact will be positive due to the conservation of natural areas but will depend on the number of persons involved in these activities.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Study ways to stimulate individual activities in this area, including publicity of resulting tax exemptions.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Trade**

POLICY: Beef Export Promotion: relatively lower export taxes for beef (1-1.8%) compared to production substitutes, such as coffee (8-18%) and sugar (7-17%).

PURPOSE: Promote the export of beef

POLICY MAKING/IMPLEMENTING INSTITUTIONS: Bank of Guatemala, Ministry of Finance

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	-1	-1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: High gains from: harvesting wood; allowing a profitable return on land when credit is exhausted and/or risk is high.

SHORT-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils habitat destruction.

LONG-RUN GROWTH: Natural forests and idle lands are converted into cattle pastures of low economic return.

LONG-RUN NATURAL RESOURCE: Cattle grazing on wet tropical soils causes compaction and soil productivity losses.

ADDITIONAL COMMENTS: Effects from this export tax is curtailed because: a small percentage of beef exports enter the formal market; low percentage of producers who pay taxes; other incentives such as quotas on cattle exports have a stronger affect on the domestic price and supply of beef. This policy has welfare distributional effects: supporting the high concentration of wealth in the cattle industry.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study feed lot production of beef for Guatemala and consider policy incentives to promote this technology.
- Empirically estimate the supply response to a change in the export tax before considering changing the beef export tax.
- Study production alternatives that have the same or better short-term economic benefits to the farmer and more positive effects on the natural resource base: i.e., forestry management and production.
- Evaluate the level and method of subsidies if necessary which insure relative profitability for these alternatives.

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NATURAL RESOURCE POLICY INVENTORY
PROBLEM: **Management of Wildlands**
POLICY CATEGORY: **Trade**

POLICY: Export Promotion of Non-Traditional Commodities: Lower taxes; public sponsoring of marketing and promotion events.

PURPOSE: Promote export of non-traditional products.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAPEX, GEXPRONT, Bank of Guatemala, Ministry of Finance, Ministry of Agriculture, BANEX, PRODAC

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-1	1	-2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Positive: transfers production activities to higher short-run profitable activities; gains in foreign exchange.

SHORT-RUN NATURAL RESOURCE: Intensified land use will reduce pressure on land. Intensive tilling, cropping practices and increased pesticide use without controls deteriorates natural resources.

LONG-RUN GROWTH: Long-run economic growth is curtailed for small producers who specialized in a limited number of non-traditional crops whose supply is highly dependent on the international market price and limited demand.

LONG-RUN NATURAL RESOURCE: Long-run effects on wildlife include: larva destruction form mangrove clearing; pesticide contamination; exports of wildlife (both plants and animals); forest habitat destruction from increased forest product exports. Intensified land use will reduce pressure on land if human population growth is controlled. Intensive tilling, cropping practices and increased pesticide use without controls deteriorates natural resources.

ADDITIONAL COMMENT: Long-term negative effects on wildlife but positive effects on forests and watershed is expected because of the fragility of wildlife ecosystems, especially in coastal zone areas.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Support studies and technical assistance for watershed management: improves pesticide and management; soil conservation; water management; fertilizer use.
- Study the potential conflict with pesticide residual restrictions in the importing countries.
- Investigate the regulation of and training for natural resource extraction practices of forests, mangroves, and wildlife that minimizes habitat and wildlife destruction.
- Study economic feasibility of tree crops (wood, fruit and spices) to improve long-term natural resource use.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Trade**

POLICY: Agreement on the International Commerce of Endangered Wildlife Species
- Protected Areas Law (Art. 25)
- Forestry Law (Art. 22)

PURPOSE: To stop and/or control commerce of endangered wildlife species (flora and fauna).

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP, CONAMA, DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: If enforced, policy discourages sale of wildlife of high market value.

SHORT-RUN NATURAL RESOURCE: If enforced, policy immediately protects wildlife.

LONG-RUN GROWTH: Positive impact due to possible high economic value of wildlife species with current unknown potential use. Tourism industry benefits.

LONG-RUN NATURAL RESOURCE: Impact on natural resources is positive due to the conservation of flora and fauna species, especially those with current unknown use or potential.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

o Study and update listing of endangered wildlife species.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Trade**

POLICY: Prohibition to export and market wildlife species in danger of extinction.
- Protected Areas Law (Art. 26, 24 & 25)
- General Hunting Law (Art. 32)
- Only allow those samples, beginning with the second generation, reproduced in controlled conditions by authorized individuals or legal entities, that meet the law's requirements, to be exported.

PURPOSE: To conserve and protect wildlife species in danger of extinction.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: By implementing this law, economic activity is not stimulated and results in a negative economic impact.

SHORT-RUN NATURAL RESOURCE: Positive impact occurs on natural resources due to protection of wildlife species.

LONG-RUN GROWTH: Economic impact may be positive for those persons or entities dedicated to exporting samples and that meet the legal requirements.

LONG-RUN NATURAL RESOURCE: Conservation of wildlife species in danger of extinction has a positive impact on natural resources.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Identify species in danger of extinction.
- Develop conservation programs for these species.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Regulatory**

POLICY: Protected Areas Law (Article 5a, 5b)

PURPOSE: Protect wildlife, biodiversity, and ecosystems

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Colonization and private investment will be reduced because licenses for economic activity will not be issued while by-laws and specific protected areas categories are developed.

SHORT-RUN NATURAL RESOURCE: Strong emphasis on ecosystem protection.

LONG-RUN GROWTH: Depends on intent of the law concerning development of sustainable agricultural and forestry management in buffer areas. Ecosystem protection will create opportunities for long-term ecotourism development and other economic activities.

LONG-RUN NATURAL RESOURCE: Strong emphasis on ecosystem protection.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Examine ways of incorporating community attitudes, goals and activities into the implementation stage of the law.
- Study economic activities in protected areas to develop culturally and ecologically appropriate long-term use policies.
- Examine successful buffer zones in other countries to develop by-laws and buffer zone categories using a "sustainable management" approach.
- Study potential growth in ecotourism market; develop strategies to promote ecotourism; define INGUAT's role and resources needed.
- Examine ways to better coordinate activities of public and private sector environmental groups.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Regulatory**

POLICY: National Reserve Areas; Agrarian Transformation Law (Art. 153, 154 & 156)

PURPOSE: State controls these areas that include: a strip three kilometers wide along the oceans, 200 meters around lakes, 100 on either side of the rivers and 50 meters around springs.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: OCREN

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	0	-1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: If complied with, this law would have a negative economic impact from revoking or denying concessions.

SHORT-RUN NATURAL RESOURCE: Impact on natural resources may be minimal as law is enforced.

LONG-RUN GROWTH: Once implemented this law could have a negative economic impact from revoking or denying concessions.

LONG-RUN NATURAL RESOURCE: Impact on natural resources may be positive as natural resources are regenerated in exploited areas, conserved and protected.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Inventory the reserve areas to determine their current condition.
- Implement protection and recuperation programs for these areas.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Regulatory**

POLICY: General Hunting Law (Art. 1, 7, 40 - 44)
- Protected Areas Law (Art. 39, 40, 41, 42, 43, 44, 45, 46)

PURPOSE: To establish conditions for hunting and procedures for conserving, increasing and using wildlife species.

- Declares national emergency to conserve, reproduce and increase all wildlife, in addition, to the natural resources that provide food and habitat for these species.
- Prohibits hunting or capture of the Quetzal and other wildlife species and their sale.
- Prohibits specific hunting methods.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: MAGA, DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	-1	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Negative economic impact due to controls that limit exploitation of wildlife species.

SHORT-RUN NATURAL RESOURCE: Positive impact on natural resources due to protection of wildlife species and their habitats.

LONG-RUN GROWTH: Negative economic impact due to controls that limit exploitation of wildlife species.

LONG-RUN NATURAL RESOURCE: Positive impact on natural resources due to protection and conservation of wildlife species and their habitats.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- o Develop alternatives for these activities, such as ecotourism.
- o Establish closed seasons for hunting.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Regulatory**

POLICY: Prohibits extraction of endangered tree species (Forestry Law, Article 22)

PURPOSE: Protect biodiversity

POLICY MAKING/IMPLEMENTING INSTITUTIONS: DIGEBOS, CONAP, CONAMA

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	0	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Some species have significant economic value

SHORT-RUN NATURAL RESOURCE: Protects biodiversity.

LONG-RUN GROWTH: Does not have a negative impact because the law does not prohibit the production of these trees.

LONG-RUN NATURAL RESOURCE: Natural resource sustainability is limited by the potential destruction of the trees' ecosystems.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Conduct protected species ecosystem studies.
- Examine means to stimulate commercial planting of protected species.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Regulatory**

POLICY: Regulation of Endangered Species
- Protected Areas Law (Art. 24, 25, 26, and 27)

PURPOSE: Prohibits gathering, capturing, hunting, fishing, transportation, exchange, commerce and exportation of wildlife species in danger of extinction.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: CONAP

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	1	-1	2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Negative economic impact on collectors and merchants.

SHORT-RUN NATURAL RESOURCE: Positive impact on natural resources due to protection and conservation of species in danger of extinction.

LONG-RUN GROWTH: Negative economic impact on collectors and merchants.

LONG-RUN NATURAL RESOURCE: Positive impact on natural resources due to protection and conservation of species in danger of extinction.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- o Conduct endangered species ecosystem studies.

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NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Regulatory**

POLICY: Political Constitution of Guatemala (Art. 60 & 61)

PURPOSE: Protect the country's cultural heritage.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: IDAEH

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
0	0	0	1

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: No effect due to social value as opposed to economic value.

SHORT-RUN NATURAL RESOURCE: Small effect due to no immediate impact on natural resources.

LONG-RUN GROWTH: Possible economic growth could be due to ecotourism but revenue would be reinvested to maintain monuments and areas.

LONG-RUN NATURAL RESOURCE: Impact may be positive with natural resource site management. The Tikal National Park is an example of how the preservation of cultural heritage has positive effects for conserving ecosystems in Peten.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study simplification procedures of site management including zoning; recreation, forest and monument areas.
- Promote and support institutional strengthening programs.
- Study the potential for ecotourism.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Development**

POLICY: Land colonization and exploration of natural resources in the Peten: promote infrastructure (roads, schools, towns).

PURPOSE: Land exploration and development of the Peten.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: FYDEP and the Commission Liquidadora de la Empresa de Fomento y Desarrolo Economico del Peten, created in 1988 to dissolve FYDEP, Consejo Regional de Desarrollo del Peten.

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	-2	-2	-2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Promoted felling of forests to plant basic grains and use for cattle grazing.

SHORT-RUN NATURAL RESOURCE: Promoted felling of forests deteriorates wildlife habitat.

LONG-RUN GROWTH: Initial agricultural production cannot be maintained due to the rapid loss in soil fertility.

LONG-RUN NATURAL RESOURCE: Deterioration and loss of forest and wildlife resources is due to the promotion of extractive forest products without using appropriate techniques for long-run sustainability of the resource.

ADDITIONAL COMMENT: Economic growth generated by the exploration of forest products benefitted foreign companies and Guatemalan special interest groups.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study ways to strengthen institutions (DIGEBOS, CONAP, DIGESA, ICTA, INTA, BANDESA) administering resources in the Peten.
- Study alternative development options to agricultural production in accordance with the natural resources of Peten: sustained forest management; agroforestry systems; sustained production of non-wood forest products.
- Assess the political power structure in the Peten and identify constraints to policy implementation.
- Assess the policy implications of the current limited physical access to the Peten.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Development**

POLICY: Agrarian Transformation Law

PURPOSE: Exploit uncultivated lands and sell lands to small farmers.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: INTA, BANDESA, CONAP, CONAMA, DIGEBOS

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
-1	-2	-1	-2

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: By making lands available to private sector, agricultural and forestry (lumber and firewood) production increases in the short run.

SHORT-RUN NATURAL RESOURCE: Wildlife (flora and fauna) habitats are reduced.

LONG-RUN GROWTH: Genetic resources, with potential but currently unknown economic benefits, are destroyed. Forest production losses may be offset by increases in ecotourism.

LONG-RUN NATURAL RESOURCE: Wildlife (flora and fauna) habitats are reduced.

PRINCIPAL POLICY ISSUES SUGGESTED FOR FURTHER ANALYSIS:

- Study methods to conserve habitats in agrarian parcels.
- Study sustainable ecosystems.
- Conduct an inventory and study of potential use of genetic resources.

NATURAL RESOURCE POLICY INVENTORY

PROBLEM: **Management of Wildlands**

POLICY CATEGORY: **Development**

POLICY: Tourism Law

PURPOSE: Promote tourism in Guatemala.

POLICY MAKING/IMPLEMENTING INSTITUTIONS: INGUAT

IMPACT ASSESSMENT

SHORT-RUN GROWTH	SHORT-RUN NAT. RES.	LONG-RUN GROWTH	LONG-RUN NAT. RES.
1	0	1	0

BRIEF EXPLANATION OF POLICY IMPACT:

SHORT-RUN GROWTH: Tourism potential in Guatemala (i.e., Ruta Maya) would result in a positive economic impact.

SHORT-RUN NATURAL RESOURCE: Impact on natural resources would depend on coordination between INGUAT and CONAP and the development of regulations.

LONG-RUN GROWTH: Tourism potential in Guatemala (i.e., Ruta Maya) would result in a positive economic impact.

LONG-RUN NATURAL RESOURCE: Impact on natural resources would depend on coordination between INGUAT and CONAP and the development of regulations.

PRINCIPAL POLICY ISSUES SUGGESTED FOR ANALYSIS:

- Study and develop tourism programs that also develop and conserve natural resources.

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TECHNICAL APPENDIX B

INSTITUTIONS' CHARACTERISTICS

This appendix provides a brief discussion of the structure, funding and role of the main public and private institutions, universities and international organizations active in the natural resource policy environment[1]. The following institutions are mentioned:

Public Sector Institutions

- Legislative
  - The Congress of the Republic
  - Environmental Commission of the Congress
- Executive
  - SEGEPLAN
  - CONAMA
  - CONAP
  - CONATIERRA
  - CONAMCUEN
  - Ministry of Agriculture, Livestock and Food
    - USPADA
    - OCREN
    - COSUCO/COREDA/COSUREDA
    - MOSCAMED
    - DIGESA
    - DTSV
    - DIGESEPE
    - DITEPESCA
    - DIGEBOS
    - GACILA
    - DIRYA
    - ICTA
    - INTA
    - INDECA
    - PROLAC
  - Ministry of Communications, Transportation and Public Works
    - CAMINOS
    - INSIVUMEH
    - DGOP
    - Executing Unit of the Xaya-Pixcaya National Aqueduct
  - Ministry of Urban and Rural Development
  - Ministry of Energy and Mines
    - General Directorate of Hydrocarbons
    - Directorate of New and Renewable Energy Sources
    - General Directorate of Mines
  - Ministry of Economy
    - CONAPEX
    - Direccion General de Comercio Interno
  - Ministry of Public Finance
  - Ministry of National Defense
    - IGM
  - Ministry of Culture and Sports
    - IDAEH
  - Ministry of Public Health and Social Assistance
    - UNEPAR
    - LUCAM
    - Environmental Sanitation Division
- Financial
  - Monetary Board
  - Bank of Guatemala
  - BANDESA
  - CORFINA
  - National Banking System
- Others
  - FYDEP/Liquidating Commission
  - INGUAT
  - IGSS
  - INTECAP
  - INACOOP
  - INDE
  - EMPAGUA
  - COGUANOR
  - INFOM
  - ANAM

Private Sector Institutions

- Associations
  - GEXPRONT
  - CACIF
  - Chamber of Industries
  - Gremial de Madereros
  - Gremial de Productores de Agroquimicos
  - CAMTUR
  - AIMPE
  - CONACOMIP
  - AGMIP
- Cooperatives
  - CONFFCOOP
  - FEDECOCAGUA
  - FECOAR
  - GREPAGRO
- NGOs
  - CARE
  - Peace Corps
  - The Nature Conservancy
  - AGRODEMA
  - FUNDACEN
  - Asociacion Amigos del Bosque
  - Asociacion Guatemalteca de Historia Natural
  - Fundacion Defensores de la Naturaleza
  - Asociacion Guatemalteca de Orquideologia
  - Sociedad Audubon de Guatemala
  - AIFLD/CUSG
  - CEMAT
- Universities
  - University of San Carlos
    - CECON
    - Faculty of Agronomy
    - CEMA
  - University of Valle
  - Rafael Landivar University

Regional and International Organizations

- IICA
- ICAITI
- CATIE
- CCAD
- CIAT
- FAO
- OAS
- OIRSA
- UNDP

[1] This appendix excludes descriptions of international donor agencies because analysis of their role in the natural resource policy environment extends beyond the scope of the Inventory.

1. Public Sector Institutions

a. Legislative

The Congress of the Republic, consisting of 100 individual members and their supporting commissions, is the legislative branch of the Government of Guatemala. Its main functions include issuing, reforming or repealing laws; approving, modifying or vetoing the revenue and expense budget of the Government; decreeing ordinary and extraordinary taxes; and contracting, converting, consolidating or implementing other operations in relation to the government's internal or external debts.

In the area of natural resources, the most important entity of the legislative branch is the Environmental Commission of the Congress, which is responsible for all legislation relating to the environment and natural resources.

b. Executive

SEGEPLAN

The Secretaria General del Consejo Nacional de Planificacion Economica-SEGEPLAN (General Secretariat of the National Economic Planning Council) is the advisory group responsible for developing all national level plans and integrating sectoral development plans based on the current government's guidelines and policies.

CONAMA

The National Environmental Commission (CONAMA) is a dependency of the Presidency created as part of the Law for the Protection and Improvement of the Environment (Decree 68-86). Its purpose is to coordinate all public or private activities relating to the development and application of national environmental policy and to provide advice regarding those activities. CONAMA is composed of a coordinator, appointed by the President, and a technical advisory council. This council consists of 10 representatives, one from each of the following: the secretary for economic planning; the public agricultural sector; the Ministries of Urban and Rural Development, Education, Public Health and Social Assistance, and National Defense; the Coordinating Committee of Agricultural, Commercial, Industrial and Financial Associations; the Guatemalan Journalist Associations; the University of San Carlos; and the private Guatemalan universities.

CONAMA has a staff of seven full-time environmental experts and sufficient budget to contract others, if necessary. These experts work with the public and the private sectors to ensure that planned governmental or private activities do not harm the environment. Also, the commission responds to complaints or allegations of environmental contamination or destruction. CONAMA is required to verify such charges and make recommendations to the authorities or take other appropriate action, such as releasing information to the press and holding public hearings.

CONAP

The National Council of Protected Areas, also a dependency of the Presidency and part of CONAMA, was created as part of the Protected Areas Law (Decree 4-89). Its principal objectives are to promote conservation of and to improve Guatemala's natural heritage; organize, direct and develop the Guatemalan Protected Areas System (SIGAP); plan and direct a national strategy to conserve the renewable natural resources; and coordinate the administration of the country's wildlife (flora and fauna) resources through the corresponding executing entities.

CONAP is made up of representatives of the following institutions: CONAMA, DIGEBOS, INGUAT, IDAEH, CECON/USAC, INTA, OCREN, ANAM, Friends of the Forest Association, the Technical Council of Education, the Nature Defenders Association, the National Council of Urban and Rural Development, the Coordinating Committee of Agricultural, Commercial, Industrial and Financial Associations, and NGOs that work on nature conservation.

CONAP's has a president (the coordinator from CONAMA) and a secretary, designated by the president of CONAP. The secretary is responsible for executing policy decisions and implementing CONAP's action plans.

Unfortunately, CONAP currently has no budget and is in serious danger of being unable to meet its objectives because the Guatemalan Congress did not approve the 1990 proposed budget presented by the President of Guatemala, which included initial funding for CONAP.

CONATIERRA

The National Land Commission (CONATIERRA) was created in 1987 as part of the National Reorganization Plan of the Guatemalan government. CONATIERRA's objectives are to create the financial mechanisms to purchase land, to provide effective education and to organize production, thereby converting the campesino with or without land into a landowner or associate of the production units that will be created and providing a reasonable payment schedule. These production units will be agricultural enterprises at the community, cooperative and association levels.

CONATIERRA consists of the Ministry of Agriculture, Livestock and Food, Ministry of Urban and Rural Development, Ministry of Finance, Ministry of Defense, the National Institute of Agrarian Transformation, representatives of the campesinos, and private industry.

CONATIERRA has not initiated operations, partly because its objectives and functions are not compatible with INTA's laws.

CONAMCUEN

The Comision Nacional Asesora para el Manejo de Cuencas Hidrograficas-CONAMCUEN (National Advisory Commission for Watershed Management-CONAMCUEN) is

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responsible for providing advice on watershed management activities and coordinating institutional projects and activities. This commission includes 14 institutional representatives: DIGEBOS; DIRYA; GACILA; INSIVUMEH; Executing Unit of Xaya-Pixcaya; Ministry of Urban and Rural Development; IGM; Directorate of New and Renewable Energy Sources of the Ministry of Energy, Mines and Hydrocarbons; SEGEPLAN; CONAMA; INDE; EMPAGUA; the Faculty of Agronomy, USAC; and CECON.

Currently, CONAMCUEN has no operating budget. If strengthened in the immediate future, it could better promote projects and activities that focus on watershed management.

The Ministry of Agriculture, Livestock, and Food

The Ministerio de Agricultura, Ganaderia y Alimentos-MAGA (Ministry of Agriculture, Livestock and Food-MAGA) is the ministry responsible for integrating, coordinating and executing all policies and programs of the public agriculture-livestock and food sector (MAGA Regulation, March 82). Because agriculture constitutes a major portion of the Guatemalan economy, this ministry is the government's entity responsible for stimulating the development of agricultural and livestock activities in the country. The Congressional Decree 51-81 states that "MAGA ... is responsible for all functions and management of research, promotion, development, transformation, processing, control, supervision and commercialization that contribute to the general or specific use of all the natural, agricultural, livestock and food resources, either in their natural or processed state."

In the area of natural resources, MAGA promotes the use, conservation and restoration of the renewable natural resources -- soil, water and forest -- by issuing all necessary measures to protect them, especially the wildlife.

Institutional policies for the agricultural, livestock and food sectors are first determined by the broad strategic guidelines and objectives of the Ministry of Agriculture, based on the Guatemalan government's development plans. Then those policies related to each sector are transmitted to the corresponding institution(s) for implementation.

The institutions within MAGA are described below. Of these, MAGA has direct control over only DIGESA and DIGESEPE. The rest are semi-autonomous and run by a council or committee to which MAGA belongs.

USPADA

Within MAGA, the development advisory group is the Sector Planning Office for Food and Agriculture (USPADA). Created by government agreement No. 11-71, March 31, 1971, USPADA is responsible for formulating projects based on the guidelines of the minister, through the acquisition, processing and analysis of information from the agricultural sector. In addition, USPADA is responsible for identifying feasible alternatives to meet the development strategies of SEGEPLAN.

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OCREN

The Controlling Office for National Reserves (OCREN) is the unit within MAGA responsible for the application of the Law Regulating the Reserve Areas of the Country controlling the national reserve lands (lake fronts, beach and ocean fronts and river and stream fronts). These lands are considered public property that cannot be sold to any individual or institution, although they can be leased for up to 35 years. OCREN was created by government agreement No. 35-73, October 24, 1970.

COSUCO/COREDA/COSUREDA

The Superior Coordinating Committee (COSUCO), the Regional Coordinating Committee (COREDA) and the Sub-regional Coordinating Committee (COSUREDA) are, respectively, the executive level, regional and sub-regional inter-institutional policy/program coordinating committees within MAGA.

The COSUCO is the principal committee responsible for coordinating sector policy and programs, interagency exchange of funds and other resources. It consists of the national directors of DIGESA, DIGESEPE, ICTA, BANDESA, INDECA, DIGEBOS, INTA and PROLAC. The minister of agriculture (or the first vice-minister) is the chair and the coordinator of USPADA is the secretary general.

COSUCO is also responsible for communication with the private agricultural-livestock sector through the Comite Superior de Coordinacion del Sector Privado Agropecuario y de Alimentacion-COSUSPA (Superior Coordinating Committee of the Private Agricultural-Livestock and Food Sector). The purpose of this committee is to receive suggestions and proposals from businesses, producers and workers in the agricultural-livestock field.

COREDA, the regional counterpart to COSUCO, serves as a forum to coordinate multi-institutional projects and strategies, to exchange information and to serve as the interface between the plans/policies of the ministry and implementation of regional programs. With the increase of multi-faceted programs requiring inter-institutional cooperation on a large scale and the Guatemalan governments decentralization policy, the COREDAs have developed into more executive/administrative entities.

The COSUREDAs are responsible for coordinating inter-institutional projects at the farm, cooperative and community level.

MOSCAMED

The Programa de la Mosca Mediterraneo-MOSCAMED (Mediterranean Fruit Fly Program) is a joint U.S.-Mexico-Guatemala program under the minister of agriculture. The purpose of this program is to detect and control the medfly in Guatemala and generally to control fruit and vegetable pests. The MOSCAMED program coordinates with DIGESA, especially in the areas of pest control and production of fruits and vegetables.

DIGESA

The Direccion General de Servicios Agricolas-DIGESA (General Directorate for Agricultural Services) of MAGA is responsible for programming, organizing, executing, evaluating and controlling agricultural production, training, infrastructure support services, technical assistance and special programs as they relate to the transfer of technology to farmers. In addition, DIGESA promotes vegetable health programs through DTSV and irrigation.

DIGESA then transmits those programs related to the transfer of agricultural technology through programs and projects to regional directors who implement them based on local circumstances. In turn, the subregional supervisors convert them to specific tactics and other activities that result in concrete achievements.

DTSV

The Technical Directorate for Plant Health (DTSV) is an office within DIGESA responsible for designing, implementing and evaluating plant health programs to increase agricultural production and protect the environment by applying quarantines. In addition, DTSV advises farmers on methods to control pests and illnesses through plant diagnostics, epidemiological monitoring, promoting integrated pest management (IPM), and control, registration, supervision and safe use of agrochemicals.

DIGESEPE

The Direccion General de Servicios Pecuarios-DIGESEPE (General Directorate of Livestock Services) of MAGA is responsible for promoting livestock production and strengthening livestock development through animal health and government quality control programs, fish and aquaculture and transferring livestock technology.

DITEPESCA

The Direccion Tecnica de Pesca-DITEPESCA (Technical Directorate of Fishing) is an office within DIGESEPE in charge of maintaining the registers and controls of the fishing, maritime and continental resources. DITEPESCA is also responsible for proposing regulations that govern the use of these resources, proposing research programs, and evaluating, considering, denying, canceling, renewing and transferring fishery concessions.

DIGEBOS

The General Directorate for Forestry and Wildlife (DIGEBOS) was created in June 1988 to formulate a forestry policy whose principal aims are to develop and regulate renewable natural resources, promote and develop commercial forestry, protect and preserve forest resources and wildlife, and coordinate activities relating to management and conservation of forest resources and wildlife with other institutions. DIGEBOS is the institution legally responsible for implementing and enforcing the existing Forestry Law.

Of the 425 technical personnel of DIGEBOS, 30% are located in Guatemala City and 70% are distributed throughout the forested regions of Guatemala. In 1988, DIGEBOS hired 1,200 field workers, of which approximately 85% work in rural areas.

GACILA

The Grupo Asesor de la Comision Internacional de Limites y Aguas-GACILA (Advisory Group of the International Commission of Boundaries and Waters-GACILA) was created by a government agreement January 4, 1980. GACILA conducts inventories of the most important characteristics of renewable natural resources in the watersheds of international rivers to design a plan and program that effectively utilizes the area and determines territorial organization. It has implemented the management plans for the Suchiate and Coatan watersheds.

DIRYA

The Direccion Tecnica de Riego y Avenamiento-DIRYA (Technical Directorate of Irrigation and Drainage) is an office within DIGESA responsible for coordinating and executing all irrigation and drainage activities. Created by government agreement No. 11-71, May 31, 1971, DIRYA conducts studies, identifies and designs irrigation and drainage projects, and analyzes the actual and potential soil use and water source capacity. It performs practical studies for the stability of river flow/volume in coordination with the Ministry of Communications and Public Works, the Emergency Committee and DIGEBOS. DIRYA is the only government entity authorized to issue water use permits.

ICTA

The Agricultural Science and Technology Institute (ICTA) is the decentralized governmental institution responsible for developing and disseminating agricultural-livestock production technology. Created by congressional decree on November 2, 1977, ICTA is charged with solving agricultural exploitation problems that affect the social welfare of the country through research and the development of materials, methods and educational programs to increase agricultural-livestock production. This new technology is transferred to DIGESA and DIGESEPE by ICTA technicians at the regional and sub-regional levels, working with extension agents from both institutions.

ICTA's governing board includes the minister or vice-minister of agriculture (presiding); minister or vice-minister of economy; minister or vice-minister of public finance; secretary of economic planning; a representative of the agricultural private sector; and, the dean, Faculty of Agronomy, USAC. The advisors include the general manager of ICTA, the director of DIGESA, and the general managers of INDECA, BANDESA and INTA.

ICTA's staff of approximately 400 includes peritos agronomos (post-high school trainees in agronomy), agricultural engineers (with university degrees in agronomy), and post-graduates with Masters or Ph.D. degrees in specific scientific disciplines.

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INTA

The National Institute of Agrarian Transformation (INTA) is an autonomous institution created by the Law of Agrarian Transformation (Decree 1551, October 17, 1962) to plan, develop and execute programs that will increase agricultural-livestock production on idle or under-cultivated lands. To achieve these objectives, INTA executes agrarian restructuring programs, redistributes land to small farmers and provides technical assistance.

INTA is directed by the National Council of Agrarian Transformation, whose members include a president and two vice-presidents (appointed by the President of Guatemala); representatives of the Ministries of Agriculture, Communications and Public Works, Economy, and Public Health and Social Assistance; a representative of the National Institute of Cooperatives; and the general director of community development. The president of the council also presides as the president of INTA.

INDECA

The National Agricultural Marketing Institute (INDECA) is responsible for providing and/or facilitating agricultural marketing activities, intervening in the exportation and importation of agricultural products and contributing to the stabilization of basic grain prices through management of grain storage silos throughout the country. This decentralized institution was created by government agreement No. 11-71, March 31, 1971.

INDECA dries, stores, transports, markets, and provides extension, analysis and quality certification of staple grains. In addition, INDECA operates a small-scale statistical reporting service that provides summaries of price fluctuations of key commodities in Guatemala City.

INDECA is governed by a board that consists of the minister or vice-minister of agriculture (presiding), the minister or vice-minister of economy, the minister or vice-minister of public finance, the secretary or sub-secretary of economic planning and the president of INFOM. The advisors include the general manager of INDECA, the general manager of BANDESA, the president of INTA and the director of DIGESA.

PROLAC

The Empresa de Productos Lacteos de Asuncion Mita-PROLAC (Milk Products Enterprise of Asuncion Mita) is a semi-autonomous institution under MAGA that processes milk, powdered milk and milk products. Its principal purpose is to promote commercialization of milk in the Departments of Jutiapa, Santa Rosa and Guatemala City.

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Ministry of Communications, Transportation and Public Works

The Ministerio de Comunicaciones, Transporte y Obras Publicas (Ministry of Communications, Transportion and Public Works) is responsible for regulating, controlling and maintaining Guatemala's communication and transportation systems (including telephone, telegraph, mail, roads and highways) and construction and maintenance of public works (including aqueducts and public buildings).

CAMINOS

The Direccion General de Caminos-CAMINOS (General Directorate of Roads) is the institution responsible for planning, designing, programming, building, supervising, maintaining and improving the network of Guatemalan roads, highways and bridges. CAMINOS opens, extends, cleans and dredges canals, navigable rivers and lakes that form part of the transportion network. In addition, CAMINOS is responsible for building barriers and other works to protect the population and the transportation network against flooding.

INSIVUMEH

The Instituto de Sismologia, Vulcanologia, Meteorologia e Hidrologia-INSIVUMEH (Institute of Seismology, Volcanography, Meteorology and Hydrology) is the government agency responsible for supervising and operating the chain of magnetic, (gravimetricas), and seismologic stations, compiling information and carrying out the respective analysis, evaluation and interpretation of data relating to seismology, volcanography, (gravimetry) and geomagnetism.

INSIVUMEH is a general directorate within the Ministry of Communications, Transportation and Public Works created by a government agreement on March 23, 1976. INSIVUMEH is responsible for evaluating the hydrological and climatological conditions of the country and is the only institution that performs evaluations of the subterranean water resources.

DGOP

The Direccion General de Obras Publicas-DGOP (General Directorate of Public Works-DGOP) executes studies, plans, designs, and programs and constructs public buildings and aqueduct and sewer projects, in addition to repairing and maintaining them. DGOP supervises the design and construction of public works done by other public or private institutions. DGOP also studies materials, soils, structures and sanitary engineering. This directorate was created by a government agreement on October 17, 1977.

Executing Unit of the Xaya-Pixcaya National Aqueduct

The purpose of the Unidad Ejecutora del Acueducto Nacional Xaya-Pixcaya (Executing Unit of the Xaya-Pixcaya National Aqueduct) is to supply Guatemala City with water by constructing an aqueduct that will carry water from the Xaya and Pixcaya rivers.

Ministry of Urban and Rural Development

The Ministerio de Desarrollo Urbano y Rural (Ministry of Urban and Rural Development) was created by Decree No. 25-86 on January 10, 1986. Its basic objectives are to promote and implement the economic decentralization policies of the government by creating conditions that allow the population to participate in the integral development of towns, neighborhoods, departments and regions. In addition, it supports the objectives and goals of the national development plans and promotes the best use of resources for development projects and programs.

Ministry of Energy, Mining and Hydrocarbons

The Ministerio de Energia, Minas y Hidrocarburos (Ministry of Energy, Mines and Hydrocarbons) is responsible for promoting, developing and implementing policies and projects that make the best use of nonrenewable, mineral, metallic and nonmetallic resources, including hydroelectric and petroleum resources. The Directorate of New and Renewable Energy Sources within this ministry is the principal office involved in renewable resources (CATIE, 1988).

General Directorate of Hydrocarbons

The Direccion General de Hidrocarburos (General Directorate of Hydrocarbons) studies, supervises and controls the processing of petroleum products. It is also responsible for inspecting and supervising the exploration and exploitation of hydrocarbon deposits and their marketing. (CATIE, 1988)

Directorate of New and Renewable Energy Sources

The Direccion General de Fuentes Nuevas y Renovables de Energia (Directorate of New and Renewable Energy Sources) conducts activities to control and coordinate at the national level the development of energy sources. This directorate promotes the use of new and renewable energy sources in rural areas by creating and recommending appropriate fiscal policies and methods to control and supervise use of these sources. (CATIE, 1988)

General Directorate of Mines

The Direccion General de Minas (General Directorate of Mines) was created by Decree No. 57-78 and modified by government agreement No. 73-84, February 10, 1984. Its purpose is to administrate, coordinate and supervise the execution of work plans and activities relating to the best use of nonrenewable natural resources (i.e. mineral, metallic and nonmetallic). (CATIE, 1988)

Ministry of Economy

The Ministerio de Economia (Ministry of Economy) implements the commerce policies of the country.

CONAPEX

The main purpose of the Consejo Nacional de Promocion de Exportacion-CONAPEX (National Council for the Promotion of Exports) within the Ministry of Economy is to propose to the President of Guatemala national policies that promote, diversify and increase exports and to monitor the implementation of these policies. The council was created by government agreement number 367-86 in June 1986.

CONAPEX consists of five members from the public sector and five from the private sector. The public sector representatives are the minister of economy (presiding); the minister of public finance; the minister of agriculture, livestock and food; the minister of exterior relations; and the president of the Bank of Guatemala. From the private sector, five representatives are named by the Chamber of Business of Guatemala to represent the agricultural, financial, tourism, cooperative, and industrial and commercial sectors.

Within this council, the Comision Nacional Coordinadora de Exportaciones-CONACOEX (National Coordinating Commission of Exports) coordinates implementation of policies for the promotion, diversification and expansion of exports. This commission includes members of all the institutions mentioned above.

Direccion General de Comercio Interno

The Direccion General de Comercio Interno (General Directorate of Internal Commerce) is the office within the Ministry of Economy that promotes policies for exportation and develops the policies on prices, quality, and markets to govern internal commerce.

Ministry of Public Finance

The Ministerio de Finanzas Publicas (Ministry of Public Finance) is the governmental agency that implements the fiscal budget. Its principal divisions are Direccion Tecnica del Presupuesto and Direccion de Financiamiento Externo. The Direccion de Rentas Internas and Direccion de Aduanas are also in this ministry.

Ministry of National Defense

The Ministerio de Defensa Nacional (Ministry of National Defense) includes all military forces of the government of Guatemala. It is responsible for national defense.

IGM

The Instituto Geografico Militar-IGM (Military Geographic Institute) within the Ministry of National Defense carries out geographic and cartographic research programs that provide detailed information on the natural resources of Guatemala, which is used to plan national development. IGM was created by government agreement No. 526-82, December 28, 1982.

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Ministry of Culture and Sports

The Ministerio de Cultura y Deportes (Ministry of Culture and Sports) issues policies that promote and preserve Guatemala's culture, sponsors cultural/educational events and controls and promotes sports activities. Within this ministry, IDAEH is the principal institute that relates to natural resources.

IDAEH

The Anthropology and History Institute (IDAEH) in the Ministry of Culture and Sports is responsible for establishing museums; improving, organizing and administering those in existence; promoting the restoration of historic monuments; and establishing national parks. IDAEH is also responsible for all activities relating to the cultural heritage of the country.

Ministry of Public Health and Social Assistance

The Ministerio de Salud Publica y Asistencia Social (Ministry of Public Health and Social Assistance) is in charge of designing and developing health programs for Guatemala's population.

UNEPAR

The Unidad Ejecutora del Programa de Acueductos Rurales-UNEPAR (Executing Unit of the Rural Aqueducts Program-UNEPAR) under the Ministry of Health implements programs to improve the health and sanitation of Guatemalans who lack drinking water. UNEPAR is responsible for constructing aqueducts in rural areas and administering, operating and maintaining the existing systems that provide water to rural areas. These aqueducts are jointly built with CARE using BID funding.

LUCAM

The Laboratorio Unificado de Control de Alimentos y Medicamentos-LUCAM (Unified Laboratory for the Control of Food and Medicine-LUCAM), within the Ministry of Public Health, performs laboratory tests that control the contents and contamination levels in food and medicine.

Environmental Sanitation Division

The Division de Saneamiento del Medio (Environmental Sanitation Division) within the Ministry of Public Health coordinates different activities that relate to environmental conservation including planning environmental sanitation activities.

c. Financial

Monetary Board

The Junta Moretaria (Monetary Board) is responsible for creating and establishing favorable monetary, exchange and credit conditions.

Bank of Guatemala

The Banco de Guatemala-BANGUAT (Bank of Guatemala-BANGUAT) is the implementing agency for the Monetary Board's policy decisions. In addition, it adopts the board's methods of payment and credit policies based on the country's production development needs to mitigate speculative and inflationary tendencies that could be detrimental to the country's development.

BANDESA

The Banco Nacional de Desarrollo Agricola-BANDESA (National Agricultural Development Bank-BANDESA), created by Congressional Decree No. 99-70 on December 3, 1970, is the government agency responsible for channeling credit to the agricultural sector. It is both a development bank and a full-service commercial bank. In 1987, more than 97% of the loans granted were to small- and medium-scale farmers and farmer organizations. (CICP/ECOTECNIA 1988)

BANDESA's resources come primarily from over 20 trust funds, with AID and IDB funds jointly providing over 93% of foreign contributions. These funds finance agriculture and livestock, rural housing, skilled trades and small industry.

The board directing BANDESA's operations consists of the minister or vice-minister of agriculture (presiding), the minister or vice-minister of finance, the minister or vice-minister of economy, the president or vice-president of the Bank of Guatemala and the secretary of economic planning. In addition, the board has four advisors: the general manager of BANDESA, the president of INTA, the general manager of INDECA, and the director of DIGESA.

BANDESA's organization includes the national headquarters in Guatemala City, regional offices, departmental agency offices and local agencies or rural credit windows (cajas rurales) that provide lending services only. Staff of the agencies or the credit windows cooperate with DIGESA and DIGESEPE extension agents in administering supervised credit to farmers.

CORFINA

The National Finance Corporation's (CORFINA) principal purpose is to promote the country's industrial, mining and tourism development through financial assistance and other activities mentioned in its bylaws. CORFINA's policies are based on the national development plans and programs.

National Banking System

The National Banking System is composed of all registered financial/banking institutions in Guatemala, both government and private. The private banks in this system are Banco de Occidente, Agricola Mercantil, Immobiliario; Granai y Townson, Trabajadores, Industrial, Ejercito, Internacional, Cafe, Metropolitano, Construccion, and Banco de Exportacion (BANEX). BANEX has close ties with GEXPRONT in promoting and exporting nontraditional products.

d. Others

FYDEP/Liquidating Commission

The Empresa Nacional de Fomento y Desarrollo Economico del Peten-FYDEP (National Company for the Economic Promotion and Development of the Peten-FYDEP) was a government agency created by Congressional Decree on July 26, 1959, but it is now defunct. FYDEP was responsible for the economic promotion and development of the Peten by integrating the region into the national economy, and scientifically exploiting and preserving its forests and other natural resources. It was also responsible for the sanitation, colonization and industrialization of the region. Currently in the last stages of liquidation, it is under the control of a Liquidating Commission created in 1988.

INGUAT

The Instituto Guatemalteco de Turismo-INGUAT (Guatemalan Tourism Institute-INGUAT) is responsible for determining, evaluating and developing tourism attractions and cooperating with other institutions that maintain, conserve, exhibit and restore national and historic monuments. INGUAT was created by Congressional Decree No. 1701.

IGSS

The Instituto Guatemalteco de Seguro Social-IGSS (Guatemalan Social Security System) provides health care to workers in private industry through clinics, hospitals and worker safety programs.

INTECAP

The Instituto Tecnico de Capacitacion-INTECAP (Technical Training Institute) is an autonomous agency of the Ministry of Labor that develops technical training programs for public and private contracting institutions.

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INACOOP

The Instituto Nacional de Cooperativas-INACOOP (National Institute for Cooperatives) is responsible for promoting and developing all of Guatemala's cooperatives by providing technical assistance.

INDE

The Instituto Nacional de Electrificacion-INDE (National Electrification Institute) is a semi-autonomous agency responsible for generating and distributing the country's electricity. In addition, based on the INDE law (Decree No. 1287, amended by Decree No. 1413 on May 27, 1959), INDE must promote and protect the development and rational use of the natural resources, which includes conserving water resources, protecting the watershed resources and rivers and evaluating the hydroelectric capacity of the country in order to stop the destructive exploitation of these resources. To conserve these resources, INDE promotes the use of electricity to heat homes instead of imported materials and/or firewood obtained from national forests.

The INDE Board of Directors includes a president and vice-president (nominated by the minister of energy and mines) and representatives and replacements from the following ministries: Energy and Mines; Communications, Transportation and Public Works; Public Finance; Economy; and the General Secretary of Economic Planning.

EMPAGUA

The Empresa Municipal de Agua de la Cuidad de Guatemala-EMPAGUA (Municipal Water Enterprise for Guatemala City) is the main agency responsible for providing drinking water to Guatemala City. Created by a Municipality of Guatemala agreement on November, 28, 1972, EMPAGUA carries out projects and studies in the valley where the city is located as well as in the Guacalate, Cuilco, Negro, Motagua and Atitlan watersheds.

EMPAGUA's governing board includes the mayor of Guatemala City (president) and the general manager of EMPAGUA (secretary).

COGUANOR

The Comision Nacional de Normas-COGUANOR (National Commission of Norms) is in charge of establishing norms of quality and quantity for commercial inputs in the country.

INFOM

The Instituto de Fomento Municipal-INFOM (Instituto of Municipal Promotion) is composed of all the municipalities of Guatemala. Created by Congressional Decree No. 1132, INFOM provides technical and financial assistance to municipal, regional and bilateral works.

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ANAM

The principal purpose of the Asociacion Nacional de Municipalidades-ANAM (National Association of Municipalities) is to preserve municipal autonomy and promote municipal development in Guatemala.

2. Private Sector Institutions

a. Assocations

GEXPRONT

The Gremial de Exportadores de Productos no Tradicionales-GEXPRONT (the Nontraditional Products Exporters Guild) is affiliated with the Chamber of Industry as a trade committee whose main purpose is to foster and develop export products. To achieve this objective, it uses fiscal incentives that promote production, facilitates processing to export Guatemalan products to international markets, seeks to modify Guatemala's trade structure to diversify products and markets, and provides the exporter with commercial promotion, information and training services. In addition, GEXPRONT works with private and public institutions to promote and develop export programs and acts as an institutional channel for funding from international institutions including USAID and the Inter-American Development Bank.

The operations of GEXPRONT have been organized into five separate groups of products: perishable agricultural products, processed foodstuffs, nonfood consumption goods, raw materials and semi-manufactured goods, and furniture and other durable products. GEXPRONT is composed of approximately 430 business affiliated members, including some cooperative organizations.

CACIF

The Camaras de Agricultura, Comercio, Industria y Financiera-CACIF (Chamber of Agricultural, Commercial, Industrial and Financial Associations) is mainly a political lobbying organization intended to represent private sector interests to the national government and promote public support. Its institutional members are the Chamber of Commerce, the Chamber of Industry, the Chamber of Financial Institutions, the Chamber of Tourism, the National Farmer's Union and the Association of Sugar Producers.

In the area of natural resources, CACIF members include the Guild of Lumber Companies and the Guild of Agrochemical Producers within the Chamber of Industry and the Chamber of Tourism. A brief description of these institutions within CACIF follows.

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Chamber of Industries

The Chamber of Industries includes all companies involved in industrial production. Two important groups within this chamber affecting forest and agricultural resources are the Gremial de Madereros and the Gremial de Productores de Agroquimicos.

Gremial de Madereros

The Gremial de Madereros (Guild of Lumber Companies) includes the largest lumber companies, exporters and sawmills in the country. Its purpose is to look out for the economic interests of its members in the various forums that exist in the country.

Gremial de Productores de Agroquimicos

The Gremial de Productores de Agroquimicos (Guild of Agrochemical Producers) includes all agrochemical producing and bottling companies, importers and exporters.

CAMTUR

The Camara de Turismo-CAMTUR (Chamber of Tourism) is composed of all travel agencies, airlines and companies related to the tourism industry. CAMTUR is currently promoting and implementing ecotourism programs.

AIMPE

The Asociacion de Industrializadores de la Madera del Peten-AIMPE (Association of Wood Industrializers of the Peten-AIMPE) is an association of companies that harvest, process and export wood from the Peten. Their main emphasis has been on valuable wood species, such as mahagony and cedar.

CONACOMIP

The National Integrated Pest Management Consulting Committee (CONACOMIP) is a non-governmental committee that advises MAGA and DTSV on policies and strategies that involve integrated pest management. Created several years ago, CONACOMIP was revived in 1988. The committee includes representative from DTSV, the faculty of agronomy of the University of San Carlos, AGMIP, USPADA, the Guatemalan Farmers Association and the Chamber of Agriculture.

AGMIP

The Guatemalan Association for Integrated Pest Management (AGMIP) was founded in 1981 as a private, nonprofit association comprised mainly of professionals interested in and dedicated to integrated pest management. AGMIP has approximately 70 members: four individuals from the private sector, two farmers, three veterinarians, three biologists, and approximately 60 agricultural engineers.

AGMIP has four principal activities: the organization of annual professional meetings on the subject of pest management, the organization of special courses or classes in IPM, the publication of a bimonthly newsletter (AGMIP Noticias) for members with information on upcoming events and short articles about IPM and the planning of projects for integrated pest management. Lack of funding has impeded implementation of planned projects, although some funding has been provided by the Chamber of the Chemical Products Industry (Gremial de Fabricantes de Productos Quimicos) for the professional meetings.

b. Cooperatives

CONFECOOP

Confederacion de Cooperativas-CONFECOOP (Confederation of Cooperatives-CONFECOOP) includes all existing Guatemalan cooperatives, including agricultural, housing, and financing co-ops.

FEDECOCAGUA

Federacion de Cooperativas Cafetaleras de Guatemala-FEDECOCAGUA (Federation of Coffee Cooperatives of Guatemala-FEDECOCAGUA) includes the cooperatives made up of the small coffee growers of Guatemala.

FECOAR

The Federacion de Cooperativas Agricolas Regionales-FECOAR (Regional Agricultural Cooperatives Federation) provides credits mainly to farmers growing traditional crops such as corn and wheat (approximately 80% of the credits are for these two crops). Over 90% of the total credits are used for purchasing fertilizers and the remainder is divided between improved seed and pesticides. FECOAR plans to eventually provide credits for high-value export crops.

FECOAR organizes one-day sessions where representatives of agrochemical companies meet with local farmers to discuss pesticides and their use (the ground rules require companies to exclude sales promotions during these talks). Participating companies include Shell, Bayer, DuPont, and Superb.

GREPAGRO

The Gremial de Proveedores de Productos para la Agricultura-GREPAGRO (Agricultural Products Distributors Guild) is an association of 24 chemical distributors, 13 multinational and 11 national. Each member company pays yearly dues and GREPAGRO can solicit special contributions of up to Q.6,000 for special programs.

GREPAGRO works directly with the DTSV program for the Safe Use of Pesticides. In addition, GREPAGRO has worked on the problems of rebottling and registration of pesticides by small retailers and carries out some educational programs.

GREPAGRO is an active member of the Agrupacion Internacional de Asociaciones Nacionales de Fabricantes de Productos Agroquimicos-GIFAP (International Group of National Associations of Agrochemical Products Companies). GIFAP represents the agrochemical industry at the international level (especially with regard to the difficulties or limitations resulting from environmental activism) with organizations that include FAO, WHO, United Nations Environmental Programme, United Nations Organization for Industrial Development, the European Community, OECD and others.

c. NGO's[2]

CARE

CARE is an international development PVO that receives funding from USAID and works in several projects in Guatemala. Two projects using AID funds currently have environmental implications, an agroforestry/soil conservation project and a potable water project. In addition, CARE has administered agricultural development projects. CARE has no separate, studied environmental policy but has essentially followed the lead of counterpart agencies.

CARE's staff includes two agricultural engineers who are graduates and one who is close to graduation; two are members of AGMIP.

Peace Corps

The United States Peace Corps, although independent of AID, is nevertheless part of the total U.S. mission in the country and often works in projects with AID funding. One of its principal objectives is to supplement the workforce of development agencies.

The Peace Corps does not have an office or personnel dedicated exclusively to environmental protection, and like CARE and other foreign-based institutions working in Guatemala, it develops its policies based on the local agencies with which it works. Its present programs include an agroforestry program in

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[2] A portion of this information was kindly provided by Alan Randall of the Nature Conservancy.

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conjunction with CARE and a natural resource conservation program. These programs involve 48 Peace Corps volunteers (PCVs) representing 19% of the volunteers working in Guatemala.

The PCVs in these programs work in extension, environmental education, the formation of local environmental protection committees, studies of the fauna and flora in selected areas, and projects to improve protected areas. They have worked in the Purulha park and are working in mangrove protection on the south coast. In addition, they have carried out studies of the environmental impact of tourism development projects.

The Nature Conservancy

The Nature Conservancy is a U.S.-based NGO that promotes nature conservation. In addition, the organization searches for funding and technical training that can be provided to nature conservation projects.

APRODEMA

The principal purpose of the Asociacion Guatemalteca Pro-Defensa del Medio Ambiente-APRODEMA (Guatemalan Association in Defense of the Environment), founded in 1974, is to defend, conserve and restore Guatemala's environment so as to improve the well-being of its inhabitants.

FUNDACEN

Since 1984 the Fundacion del Centavo-FUNDACEN (Penny Foundation) has been operating a commercial land markets program with AID funding. This program purchases large farms on the free market, divides them into small (2.8 hec) plots and sells them to land-poor farmers or landless agricultural laborers on 10-12 year terms. Through production credits, technical assistance is provided to covert the plots to high-yield cash crops. This assistance is provided by agronomists who supervise several "farms" and by a resident agricultural technician on each "farm."

Asociacion Amigos del Bosque

The Association of Friends of the Forest, founded in 1959, is the oldest registered NGO that promotes the conservation of trees in particular and the environment in general. Besides the main office in Guatemala City, it has nine affiliate offices throughout the country and 950 members.

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Asociacion Guatemalteca de Historia Natural

The Guatemalan Association of Natural History promotes the management and use of natural resources.

Fundacion Defensores de la Naturaleza

The Defenders of Nature Foundation promotes conservation of natural resources and preservation of animal and plant species. The organization is working on a drive to declare the Sierra de las Minas a biosphere reserve and to manage it as such.

Asociacion Guatemalteca de Orquideologia

The Guatemalan Orchid Association promotes the preservation of orchid species and their habitats.

Sociedad Audubon de Guatemala

The Audubon Society of Guatemala promotes the identification and preservation of bird species and preservation of their habitats.

AIFLD/CUSG

The American Institute for Free Labor Development-AIFLD operates a project to work with the Guatemalan Confederation for Union Unity (CUSG) using AID funds. CUSG is an umbrella organization that has organized small farmers into agrarian "unions" and added other agrarian/farmer associations to its more traditional salaried union membership. As a result, the agrarian area now represents about half of the total CUSG membership.

This project combines organization and union development with services that are designed to improve the economic position of the agrarian members through agricultural production credits and technical assistance.

Staffing of the AIFLD/CUSG project includes only one field agronomist in CUSG and none in AIFLD. The field technical staff has only two agricultural technicians (perito agronomos).

CEMAT

The Centro Mesoamericano de Estudios sobre Tecnologia Apropiada-CEMAT (Mesoamerican Study Center for Appropriate Technology) is a nonprofit organization whose permanent main office is in Guatemala. Its objectives are to promote economic development, technical cooperation and social progress in Guatemala. Its activities include renewable energy, environmental improvement and resource conservation.

In addition to the NGOs mentioned above, the following is a list of the registered organizations operating in Guatemala that have some impact on natural resources:[3]

Asociacion Amigos del Pais (Association Friends of the Country)

Asociacion Tikal (Association Tikal)

Autosafari Chapin --Reserva de Vida Silvestre (Autosafari Chapin--Wildlife Reserve)

Academia de Ciencias Medicas, Fisicas y Naturales de Guatemala (Academy of Medical, Physical and Natural Sciences cf Guatemala)

Asociacion de Entidades de Desarrollo y de Servicio No Gubernamentales de Guatemala (Association of Development and Nongovernmental Service Entities of Guatemala)

Comite Pro Operacion Quetzal (Pro-operation Quetzal Committee)

Comite del Lago de Amatitlan (Amatitlan Lake Committee)

Instituto Guatemalteco de Arte Colonial (Guatemalan Institute of Colonial Art)

Fundacion Interamericana de Investigacion sobre Aves de Rapina (Interamerican Foundation for Research of Birds of Prey)

Asociacion Cultural Pro Medio Ambiente (Cultural Association Pro Environment)

Fundacion para el Desarrollo de Guatemala (Foundation for the Development of Guatemala)

Companeros de las Americas Guatemala-Alabama (Friends of the Americas Guatemala-Alabama)

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[3] Within Guatemala, over 1,200 NGO's exist that are involved in small projects affecting the natural resources of the country. Their relation to natural resources and the policy environment was not included because it goes beyond the scope of work for this inventory.

3. Universities

Guatemala has a total of five universities, one public, the University of San Carlos, and four private, University del Valle, Rafael Landivar University, Francisco Marroquin University and Mariano Galvez University. The University of San Carlos, University del Valle and Rafael Landivar University are the principal centers of higher education involved in natural resources.

a. University of San Carlos

The Universidad de San Carlos de Guatemala-USAC (University of San Carlos of Guatemala), the only public university in Guatemala, has its main campus in Guatemala City and nine regional centers throughout the country.

USAC has representation in other agencies that affect, influence or issue policies on natural resources, including CONAMA's technical consultant council, the Monetary Board-BANGUAT, and CECON-USAC in CONAP.

Under the Government Agreement No. 60-89 (Art. 18) between the Ministry of Public Health and Social Assistance and CONAMA, USAC and private university labs are authorized to monitor, analyze and control wastewaters.

The main university entities/faculties involved in natural resources are CECON, the Faculty of Agronomy and CEMA.

CECON

The Centro de Estudios Conservacionistas-CECON (Center of Conservation Studies), in the School of Biology, Faculty of Chemical Sciences and Pharmacy, manages the biotopos and researches and studies the renewable natural resources. CECON studies the national system of protected areas and the conservation of ecosystems and rare or endangered species. CECON has an institutional agreement with INGUAT to provide technical assistance in managing cultural, archaeological and natural monuments.

Faculty of Agronomy

The Faculty of Agronomy has five-year programs (B.S. level) in agronomic engineering, agronomic engineering in renewable natural resources and forest engineering. The latter two have been established in the last 10 years.

The renewable natural resource specialty program emphasizes evaluation of resources, development and use of management plans and design and execution of research based on renewable natural resource problems.

The forest engineering program, operating only in the Huehuetenango regional center, is a recently established program created to fill the gap for professionals specializing in forest resources.

CEMA

The Centro de Estudios del Mar y Acuacultura-CEMA (Center for Ocean and Aquaculture Studies-CEMA) is a regional entity of USAC responsible for ocean research and training of technicians in aquaculture.

b. University del Valle

The Universidad del Valle (University del Valle) is a private Guatemalan university, with an agronomic engineering program and Department of Biology that has done studies of pesticide effects on biodiversity and has proposed a three-year technical and five-year licensed degree program in ecotourism.

The university's Institute for Environmental Studies has submitted grant proposals for masters degree programs in ecology and environmental studies.

c. Rafael Landivar University

The Universidad Rafael Landivar (Rafael Landivar University), also a private university, has an Institute of Environmental Sciences and Agricultural Technology whose technical and licensed degree programs emphasize applied research and development programs based on the existing conditions of natural resources and the development and application of agricultural technology.

4. Regional and International Organizations

IICA

The Instituto Interamericano de Cooperacion para la Agricultura-IICA (Interamerican Institute of Agricultural Cooperation-IICA) is an entity of the Organization of American States that provides consulting and technical assistance for agricultural and economic development of Latin American and Caribbean countries. IICA has agricultural programs within individual countries or across countries and regions, thereby promoting cooperation among them.

In Guatemala, IICA coordinates activities with DIGESA, DIGESEPE, ICTA and DIGEBOS, CONACOMIP and the Guild of Agrochemical Producers.

Two principal programs are the Plant and Animal Health Program and PROMECAFE, which has AID/ROCAP funding. These programs provide public sector institutional strengthening through diagnostic studies, pesticide use, extension and training, technical cooperation projects, establishment of plant sanitation networks and activities that are directed at controlling the coffee borer and leaf miner. (CICP/ECOTECNIA 1988)

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ICAITI

The Instituto Centro Americano de Investigacion y Tecnologia Industrial-ICAITI (Central American Institute of Industrial Research and Technology-ICAITI) is a regional organization founded by the United Nations in 1956 that receives ROCAP funding. Although its primary focus is industry, ICAITI's interest in industrial pollution has lead it to examine environmental pollution, specifically pesticides. ICAITI leads agricultural pesticide research in the region through the Environmental and Economic Study of the Consequences of Pesticide Use in Central American Cotton Production.

ICAITI's Testing and Analysis Division is the principal department that addresses environmental problems by investigating the principal problems and then applying the most appropriate low-cost technology.

CATIE

The Centro Agronomico Tropical de Investigacion y Ensenanza-CATIE (Tropical Agricultural Research and Training Center-CATIE) provides training and technical assistance for agriculture and natural resource management. CATIE has intercountry and regional programs and promotes cooperation among these countries. CATIE currently has three programs operating in Guatemala that receive ROCAP funding: MADELENA, Integrated Pest Management and Higher Education.

CCAD

The recently formed Comision Centroamericano del Medio Ambiente - CCAD (Central American Environmental Commission) will be composed of five senior advisors, with the presidents of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua each appointing one advisor.[4] The advisors will serve rotating terms as president of CCAD, each holding the position for one year. They will be supported by a secretary, who will be responsible for implementing the resolutions approved by CCAD and its president and by ad-hoc technical support groups. CCAD's main office will be located in Guatemala City, with supporting offices in each of the other member countries.

CIAT

The Centro Internacional de Agricultura Tropical-CIAT (International Center of Tropical Agriculture-CIAT) supports the agricultural research of ICTA, especially in beans, rice and tropical pastures.

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[4]Recently, Panama and Belize have been invited to participate in the CCAD.

FAO

The Food and Agriculture Organization-FAO of the United Nations develops and sponsors research and programs for agriculture and livestock in developing countries. FAO has incorporated natural resource and fishing programs into its technical cooperation programs. In addition, since October 1989, FAO has been supporting the development of the Guatemalan Tropical Forest Action Plan-PAFG (Plan de Accion Forestal Tropical en Guatemala-PAFG).

OAS

The Organization of American States-OAS has a regional development program that formulates development and natural resource conservation projects. The OAS provides funding for projects such as the Development Plan for the TRIFINIO region (Guatemala-El Salvador-Honduras} in conjunction with IICA and limnological studies in Lake Amatitlan, among others.

OIRSA

Organismo Internacional/Regional para Sanidad Agropecuario-OIRSA (International/Regional Organization for Agricultural-Livestock Health-OIRSA) is in charge of maintaining animal and plant health in the Central American isthmus.

UNDP

The United Nations Development Programme-UNDP provides financial and technical assistance to the developing countries of the world. In Guatemala this program coordinates with SEGEPLAN and develops projects with the public agricultural-livestock sector.

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