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AGRICULTURAL POLICY ANALYSIS PROJECT, PHASE II

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1.0 INTRODUCTION

Natural resource and environmental issues arise from a complex structure of economic, social and physical interdependencies. The role of policy in determining the use of resources and the state of the environment is also complex and a realtively new area of inquiry. In order to begin changing the resource management regime it is necessary to make a rapid appraisal of existing policies and problems which establishes priorities and narrows the scope of the policy analysis agenda. A policy inventory is designed to meet these objectives. There are five principal steps to performing a natural resource policy inventory:

1. Identification of Problems;

2. Identification of Policies;

3. Identification of Role of Institutions;

4. Analysis and Assessment of Policy Impacts on Natural Resources and the Economy;

5. Identification of Research Priorities and Policy Options to be Studied.

The first step in the process is the identification of problems and organizing those problems into taxonomies which will facilitate the steps which follow. Resource and environmental problems arise when the use of renewable resources exceeds the ability of those resources to be naturally replenished. Uses exceed the capacity for sustained use of the resource. This occurs in Honduras with the over-exploitation or mining of soil, groundwater, timber and wildlife resources, among others. In the case of the wildlife, for example, the losses could be irreversible. Problems also arise when natural resources cannot cope with the level of residuals from human activities such as pesticides, urban wastes and mining. Management of these problems often involve trade-offs between current and future economic and environmental conditions.

This report has defined four problem areas for analysis.

1. Sustainable agriculture issues include land utilization, soil fertility and pesticide use.

2. Production from Natural Forest issues include deforestation, reforestation and forest management.

3. Wildlands and biodiversity issues include endangered species protection, park and reserve management as well as other biodiversity and resource use interdependencies.

4. Watershed management issues include water use, water quality and water management.

Identification of policies also includes the development of a taxonomy of policy types. The taxonomy used for this analysis is derived from a traditional economic framework. Macroeconomic policies are examined within three sub-components: monetary, fiscal and trade policies. When specific policies have fiscal or trade effects on a given problem area, those issues are also included. For example, trade policies will have a general influence on many resource use issues but endangered species trade quotas will address a particular problem. Other policy categories include tenurial issues in control of land, water and trees; regulatory controls over resources and; sectoral and sub-sectoral policies particular to agriculture, forestry, etc. Finally, the overall development and environmental planning process as it addresses or does not address the problem areas is reviewed.

Also included is a description of the principal institutions in the country which affect economic and resource policies. While these institutions are often governmental or quasi-governmental, other institutions are also described. These include significant private sector and industry groups, non-governmental organizations and international agencies. This description provides the basis for understanding the general approach taken to resource management as well as the role and capacity of the various sectors, agencies and institutions.

Analysis and assessment of the effects of policies is a process of understanding the behavioral responses of people using resources. This entails a combination of empirical observation and economic theory. From a practical point of view there is a wide array of indicators for both economic and environmental effects of policy on resource problems. A fundamental question is what are the effects of the policy on short-term as well as long-term economic and environmental conditions. The indicators of these effects will vary with the problem. For example, economic indicators can include commodity prices, fiscal deficits, rural income, tax revenues, among others. Environmental indicators can include, for example, the rate of depletion of soil, forests, wildlife as well as siltation, pollution and toxicity of residues.

The purpose of an inventory is to reach a tentative conclusion about policy effects and reforms and establish an agenda for further analysis and research. Determining those recommendations comes from a process of estimating the importance of a given aspect of a problem area and the policies which have the most influence on the problem and/or the most likely policy subject to change with a refined analysis of options. Those options may well include policies not currently existent in the country but for which some experience in application exists in other countries.

Important resource and environmental effects of policy changes remain to be understood and studied. Empirical evidence is scarce which connects policy regimes or changes that have broad economic importance such as macroeconomic monetary, fiscal and trade policies and sectoral policies with their effects on natural resource users and outcomes. What we are left with is a series of questions and research issues and little in the way of definitive answers. Often we depend solely on economic theory or even more broadly on behavioral assumptions which may or may not play out in a real world context. Nevertheless some conclusions can be reached relatively easily, and would, perforce, require some action because of the severity of the problem. Other issues can be deferred

until more indepth analysis and research are completed. The approach taken in this inventory encompasses both of these approaches and outcomes.

2.0 SUMMARY AND REVIEW OF FINDINGS

Prior to the review of the problem areas and recommendations for policy changes and further analysis and research which follows, a brief listing of findings and analytical issues will be presented.

Macroeconomic Findings and Issues

- Until recently the overvalued Lempira was an implicit subsidy for imports and an implicit tax on exports. This contributed to skewed prices against the agricultural sector compared to other sectors.

- Devaluation may shift production in favor of export crops.

- While pesticide use may increase as a result of an increase in short-cycle, non-traditional export crops, the prices of pesticides should increase with the elimination of the implicit subsidy for exports. Policies in neighboring countries may also affect supply and prices.

- The need to increase foreign exchange has led to policies which have some negative natural resource and environmental effects because of inappropriate input use or mining of resources.

- Devaluation and elimination of other policies which have skewed relative prices against agriculture will probably affect farm level prices but the results are not necessarily guaranteed because of intermediation and market structure.

- If prices do reach the farm level, the availability of other inputs, tenure, credit and technology will determine the ability of the farmer to respond by increasing productivity versus production. Increases in production can result from marginal land conversion and soil fertility depletion.

- Expansion of the money supply and inflation discourages long-term investments and encourages short-term trading activities which result in resource mining.

- Agricultural credit is available at subsidized rates to generally large operations involved in export crops and extensive cattle production.

- The conservative banking institutions finance generally short-term inputs and not long-term investments. Credit often goes to fertilizers and pesticides for short-cycle crops and not for soil conservation or Integrated Pest Management (IPM).

- The fiscal deficit limits the ability of the government to provide the services needed to protect the environment and natural resource management. Government deficits cannot be financed with domestic credit without increasing inflation. Internal sources of financing reduces the availability of credit for private sector activities. Longer term investments such as irrigation, drainage and soil conservation would not occur.

- Interest on foreign debt has been a primary factor in balance of payment deficits and is a source of pressure for increased exports to get foreign exchange. The payment of interest on the foreign debt leads to a shortage in foreign exchange and overvaluation of the Lempira.

- Resource using firms in such circumstances have difficulty in importing the technology needed to improve efficiency.

- Current expenditures (for salaries and wages) have rapidly expanded at the expense of capital expenditures. This represents a reduction in government investments in infrastructure needed to support economic development.

- Revenues from various resource management related taxes and fees are inadequate because of poor administration and failure to capture the economic gains or rents which should accrue to the government.

- Trade policies have been highly protectionist of the industrial sector thus biased against the agricultural sector.

- Most industrial imports were through the non-official exchange rate while agricultural goods were imported through the official exchange rate.

- Low returns to agriculture has resulted in more unemployment and underemployment and migration from rural to urban areas.

- Subsidized wheat imports have had a negative effect on corn production and increasing dependency on food imports. This discourage production of staples and increases pressure on forests by poor to increase their income.

Tenure Findings and Issues

- Land holdings are highly skewed and the best quality land with the least environmental fragility is organized into large, extensive cattle operations. Smaller, untenured farmers operate on erodible hillsides and/or in slash-and-burn activities in tropical lowlands.

- The government has assumed ownership of most land, water and forest resources but lacks the ability to manage the resources.

- Land planted to basic grains has until recently been subject to expropriation.

- Ceilings on the size of holdings are high and when seen with other factors help promote extensive cattle operations.

- Trees have been cut to avoid expropriation since forests are considered vacant land. INA requires that ninety percent of land has to covered in permanent crops. This leads to cutting of forests in the INA settlement areas. None of these regulations or procedures address land suitability.

- There are many potential land tenure arrangements available to encourage sustained resource management. No one system will provide all of the answers. Private property or ownership does not necessarily result in sustained use if the operators are functioning in a short-term trade versus long-term production environment. Communal tenure arrangements can break down with over population or poor technical support. De jure government ownership has however not resulted in de facto control or in sustainable resource use.

- The Agrarian Reform Law bans land rental or mortgages which impedes the land market. Titles are not granted for twenty years when land value has been paid off. This has resulted in a high rate of abandonment.

- COHDEFOR legally controls trees on private lands even though the soil belongs to the owner. This legal control is mostly ineffective and has not been management oriented as COHDEFOR has concentrated on production and marketing activities.

- AMI (Areas de Manejo Integrada) and Tributary Areas have not been properly managed or supported. They have also often conflicted with each other territorially.

- While the government has legal ownership of most water in Honduras, environmental and management issues are not effectively addressed. Pollution is uncontrolled, irrigation infrastructure is small and deteriorating, and groundwater is being depleted because of watershed destruction.

- The government has legal ownership of all fisheries and regulates extraction activities. It prohibits destruction of mangroves. Enforcement of these legal powers has been weak.

- The government of Honduras as a member of CITES regulates the export of endangered species. This control is ineffective and will likely remain so given high international demand and the income potential this trade supplies to the poorer elements of the population.

Sectoral and Regulatory Policy Findings and Issues

Sustainable Agriculture

- Attempts by the government through IHMA to control basic grain imports and manipulate market prices have by and large failed to influence prices. Some downward pressure has been placed on rice but most of the price effects are captured by intermediaries and does not reach the producer. The results are ineffective government activities and no increase in the returns to agricultural production. Recent and anticipated policy changes should improve the situation.

- Basic grain regulations have been changes to encourage production. This has also included elimination of the potential for expropriation of lands cultivated to basic grains. Results thus far are not conclusive. The approach taken is to increase productivity and not expand production.

- The government has had retail price controls which have not been effective and has primarily benefitted the urban middle class. This has contributed to the set of policies which have contributed to lower returns to agriculture.

- The government has also operated a chain of food stores which have contributed to the effects noted above as well as been a costly and inefficient drain on government funds.

- Credit is provided primarily to large producers at subsidized rates for short-term loans. BANADESA has large arrears from the public sector loans (including the reform sector) as well as the private sector loans. This has contributed to a lack of credit for adoption of technology to increase productivity.

- Control mechanisms for pesticide import and use is ineffective. Significant localized health and production problems exist. Institutional capacity is weak. While some IPM technology exists its adoption is hampered by preferences given to chemical inputs by credit institutions.

Production from Natural Forests

- COHDEFOR has concentrated its efforts on timber production and marketing and has not directed effort or resources to the management of forests. Its institutional capacity in this area is weak. It has no effective control of forest activities.

- Development activities with forests product cooperatives and AMI have not been adequately supported. At times these activities have conflicted with timber concessions known as Tributory Areas.

- Activities in production and marketing through parastatals has been unsuccessful and many of these activities have been or are in the process of being sold to the private sector.

- The timber industry in Honduras is highly concentrated and oligopolistic. Timber has not been managed for sustained use but is instead mined. While slash-and-burn activities has been a principal source of deforestation, timber mining as also been important.

- The legal ownership of all timber resources by the government through COHDEFOR has not been effective on resource use. This has resulted in a de facto open access resource where the incentives of resource users is to use the resource as quickly as possible before others get to the resource.

- There is very little reforestation activities by the government or by the private sector; the exceptions being donor supported projects.

Management of Critical Watersheds

- Development of hydroelectric power has until recently ignored watershed management issues of soil erosion and sedimentation. Problems of reduction in the economic life of projects has been evidenced in some projects.

- Many institutions have responsibilities which influence watersheds. Many conflicts are evidenced. For example, INA has established settlements in areas designated as parks or reserves.

- Lack of incentives for long-term investments has inhibited the development of irrigation. Existing public projects has deteriorated because of an inability to cover recurrent costs.

- A large irrigation project in the Choluteca valley could well represent trade-offs between increase short-term employment from foreign exchange generating crops and down stream effects of pesticide run-off in the Gulf of Fonseca as well as soil salinization already evidenced in the region.

- The Gulf of Fonseca has a complex set of resource management issues involving the interdependence of mangrove forests, shrimp farm development, artisanal fisheries, salt production and fuelwood collection, among others. The institutional situation is also complex and results in a process which does not adequately address natural resource and environmental issues.

- Urban, industrial and mining discharges while legally restricted or prohibited are not effectively controlled by either central or municipal governments. Existing penalties or either not applied or too small to change behavior.

Protection of Wildlands and Biodiversity

- The national park and reserve system is ad hoc and has not been in response to any explicit conservation or preservation criteria.

- Most of the parks and reserves exist only on paper. Management, where it exists, is insufficient. Parks and reserves are attempts at changing tenurial systems but have not been effectively managed. This, as is the case with forests, results in a de facto open access resource.

- Many institutional conflicts exist. In particular, the settlement policies of INA have resulted in incursions into national parks and reserves. Other activities by COHDEFOR have similarly ignored park boundaries.

- Many of the resources in such reserves are believed to be endangered and further losses will likely prove to be irreversible. Those losses could impede long-term economic development arising from, among other things, ecotourism.

- Trade in wildlife and incursions into national parks and reserves result from and reflect population growth, tenure systems and policies which have been biased against the agricultural sector.

Development and Environmental Programs

- Planning activities in Honduras have not adequately addressed environment and natural resource issues.

- Planning for roads is just beginning to include environmental criteria. Political criteria have been the primary criteria.

- The central government has been the most important government institution. Municipalities have played a small fiscal and management role. Proposed changes in the federal system giving more responsibilities and authority to municipal governments will not necessarily improve resource management.

- The proposed General Environmental Law can begin a process of consistent inclusion of environmental criteria into government activities and private behavior. However, weak institutional capacity and unclear institutional responsibilities will need to be addressed.

3.0 SUSTAINABLE AGRICULTURE

Problem Areas

Land utilization, soil fertility and pesticide use are the principal problems areas for sustainable agricultural production.

Land utilization issues can be summarized as follows: 1 - 1.5 million hectares of pastures and crops are on land which should be in forest use and an additional 2.3 - 2.8 million hectares have been degraded by shifting agriculture; .6 million hectares of broadleaf forest could be cropped; and as much as 0.5 million hectares of pasture land could be in intensive annual or perennial crops. This suggests both over-utilization and under-utilization of land in Honduras.

Soil fertility problems are difficult to document precisely. While the yields of some crops have increased, production is still low. The eroded area in 1987 was estimated at 2.3 million hectares which suggests an erosion rate of 150,000 hectares/year. This could mean that 40 percent of the country could be eroded by the year 2000.

Pesticide use problems are not systematically documented but is the subject of concern. Evidence from various health sources have shown cases of pesticide related poisoning. High residue levels have been found in cattle. Pesticide misuse is responsible for land use problems in areas with non-traditional exports.

Policy Issues

A critical issue for Honduras will be to better understand the role of macroeconomic policies and how they affect resource use. These issues are generally complicated and not particularly well understood by either policy makers or economists. The problems of analysis will include differing effects on various resources and the need to address other constraints which will impede what should be happening given the assumptions of the economic model. Honduras has embarked on policy changes which should affect economic conditions in rural areas in both the short-term and long-term. Tenure and wealth distribution issues may not necessarily allow for resource problems to be improved by those changes. To greater and lesser degrees the first four policy study recommendations made below address this issue.

1. Macroeconomic Policy Changes

Macroeconomic policies have resulted in low prices for agricultural products in Honduras. Until recently the Lempira was overvalued and tariff and trade policies favored imports over exports. For example, an overvalued exchange rate implicitly subsidizes imports and implicitly taxes exports. In April, 1990 the Callejas government freed the exchange rate and also announced changes in tariffs and export taxes. These changes should increase the cost of imports and increase agricultural exports and returns to agriculture. This should provide incentives to increase agricultural production and improve the efficiency of the use of imported inputs such as pesticides.

However, improved resource management may not necessarily be a result of these policy changes. The mining of soil could occur without complementary policies designed to encourage long-term investments to increase productivity. This includes tenure issues. Therefore, the effects of macroeconomic policy changes on agricultural land use and the agricultural frontier should be further studied. If price increases reach the farm level, do they increase pressure on the agricultural frontier or increase productivity on land currently under cultivation? Do those increases in productivity involve soil mining or inappropriate input use in the short run which will result in longer term losses in productivity? It will also be important to study policy effects on forest use and exports because of similar trade-offs as suggested for agriculture. Price improvements could result in resource mining and policies designed to ameliorate these effects should be analyzed.

2. Sectoral Policy Changes

Sectoral policies have also had the effect of reducing returns to agricultural production. These policies have included producer price controls, public monopoly on basic grain imports, consumer price controls and subsidized credit, among others. The Callejas government has announced decisions to privatize the IHMA silos and to free basic grain imports. Studies are being conducted by the government on other changes, including the system of guaranteed prices based on production costs instead of international prices. These changes should increase returns to agriculture and reduce government expenditures. As with the macroeconomic policy changes mentioned above, it will be necessary to study the effects of these policies on intensification of production in agriculture and the effectiveness of policy changes in reducing pressure on the agricultural frontier. Understanding these issues within the other constraints faced by Honduras will help not only policy management in Honduras but other countries coping with similar issues.

3. Land Tenure Insecurity and Land Distribution

The control of the most fertile farmland in Honduras is held by a small number of people who often use such land for extensive cattle operations. Many small subsistence farmers are forced to farm on highly erodible hillsides or on forest land unsuitable for long-term farming. These lands are officially owned by the government which, however, does not have effective control over their use. In addition, land titling procedures are slow and inhibited by the absence of a cadastre. These factors influence the willingness of the users of resources to invest in long-term resource management. Instead they encourage slash-and-burn and extensive cattle activities. For example, until the Basic Grains Law of 1989, land could be expropriated if planted to basic grains. Cattle raising is de facto immune from expropriation. Therefore, studies of alternative tenurial arrangements for resource use are needed, including methods to develop land markets. For example, what is the effectiveness of the certificates of possession in the LUPE project?

4. INA and Reform Sector Performance

INA settlements are responsible for approximately 20 percent of the agricultural production of the country. Yet some cooperative lands are under-

utilized. One reason is that settlement and cooperative land cannot be owned or mortgaged for twenty years. Few land titles are granted because payments are not made on these lands. There seems to be little incentive for long-term resource management. Credit and technical assistance were also at times provided, but these services have been deficient and much of the credit has not been repaid. Therefore, it is recommended that further analysis study the incentives needed to improve resource management by securing titles. Research should also examine reasons for the concentration on basic grains in the reform sector.

5. Pesticide Use Alternatives and Credit

While there are many aspects to the pest management and pesticide use issue in Honduras, including deficiencies in the legal structure, issues associated with the availability of credit for non-chemical pest control seem a promising area for more analysis. Some technology exists to reduce pesticide use but faces the bias of credit institutions in favor of chemical inputs, often short cycle export crops (K. Andrews, personal communication). Credit policy changes are needed to support IPM adoption. Recent macroeconomic policy changes should improve the economic potential of IPM alternatives to intensive pesticide use by improving returns to agriculture and agricultural labor. Analysis should also address credit policy options to support commercial insect development for biological control of pests. There are two presently operating in Honduras.

Potential Policies

1. Land Taxes could encourage the development of land markets but will need a complete cadastre. Admittedly the record of successful land tax implementation in Latin America is scarce.

2. Roll-over leases for occupants of public lands could provide security within an economically relevant period for the user. Do you need fee simple title or can a leasing structure adequately address security needs within the time horizon most economically relevant decisions are made?

3. Tax on toxicity of pesticide imports could discourage the import of the more dangerous pesticides. It would be, however, difficult to administer.

4.0 PRODUCTION FROM NATURAL FORESTS

Problem Areas

Deforestation, reforestation and forest management are the focus of the analysis of this problem area. Of the 2.8 million hectares of pine forest in 1964, 0.4 million hectares had been converted by 1986 to low grade pasture for extensive cattle production and about 50,000 hectares are in some sort of subsistence annual cropping. The 2.4 million hectares which remain are being logged at 40,000 hectares annually of which only 25,000 hectares are permitted to regenerate naturally and 15,000 hectares are converted to native pasture. The quality of the remaining pine forest area is steadily deteriorating as the

percentage of mature trees suitable for lumber declines - the proportion of mature commercial timber volume to total timber value was reduced from 70 percent to 40 percent over the period 1964-1986. Projection of the above trends would reduce production to 20 percent of current levels by 2010. In broadleaf forests, 4 million hectares which stood in 1964 have been cleared at an average annual rate of 65,000 hectares leaving 2.6 million hectares by 1986. At this rate the forest would be eliminated by 2025 (World Bank, 1989).

The government of Honduras through COHDEFOR has ownership of all forest resources in the country. It has also had at one time or another control of most production and marketing activities related to lumber. Very little resources or effort has gone into reforestation or management of forests. The mining of timber resources has been basically unchecked under this management regime.

Policy Issues

Pine and broadleaf forests represent two differing but important resource management issues. With pine forests there is documented evidence of its potential for sustained resource management. However, that potential has not be reached and this resource is in effect being mined. Broadleaf forests are disappearing at four times the rate of the pine forests but are seldom commercially exploited. Instead, these forests are being lost to the expanding agricultural frontier. The government of Honduras through COHDEFOR has ownership of all forest resources in the country. It has also had at one time or another control of most production and marketing activities related to lumber. Very little resources or effort has gone into reforestation or management of forests. The mining of timber resources has been basically unchecked under this management regime.

Open access resources, resources not effectively controlled by any one user or user group, are resources where the incentives are to over-exploit or mine the resource. This is the case because forbearance by one user is not matched by other users. The incentives are to get as much as possible before others get to it first. This is the case with forest resources in Honduras. While the government claims ownership and has regulations governing behavior, that control is ineffective. Most of the policy analyses recommended below examine various alternative forms of control of forest resources. This ranges from private ownership of land (now being actively considered by the Callejas government) improved community management of land (AMI) and better management of government owned land by consideration of appropriate leasing concessions. All of these activities have the potential of improving effective resource control and providing incentives for sustained use management. Nevertheless, these approaches should also consider interdependence with other factors which may lead to poor resource management. These include macroeconomic conditions which favor trade over production activities.

1. Private Sector Incentives and Regulations

COHDEFOR has statutory control and ownership of the forest resources of Honduras. COHDEFOR activities have, however, focused on production and marketing. The government cannot adequately administer the authority over trees it has assumed. This has resulted in an open access resource which is under no

effective control by any resource user. Therefore, no one has an incentive to manage the resource for sustainable use. Instead the resource is mined or more commonly destroyed by slash-and-burn agriculture or by cattle operations. Given these conditions private ownership of forests could be considered a viable alternative. Since management, even by the private sector, often depends on time preferences which do not support sustainable uses, effective regulatory policy will also be needed. Therefore, it is recommended that the incentives and regulations needed to ensure sustained forest management by private sector ownership and control of trees and forests be further studied.

2. Role and Potential of AMI

COHDEFOR has assigned limited financial resources (1%) to AMI activities. It is of little surprise, therefore, that AMI have not functioned well. The potential of AMI have not been fully developed or examined. There are many successful social forestry systems in developing countries. Experience from these can be incorporated into the Honduran system but further research and analysis should isolate the nature of the problems. This system would represent, along with private ownership and better management of concessions, an important approach to developing sustained resource use. It is recommended that problems and policies as well as fiscal requirements to make AMI successful be studied and further appraised.

3. Timber Concessions

There is at present a minimal amount of forest land being managed for sustained timber production. The concept of tributary areas for timber companies have encountered conflicts with other users and do not correspond with AMI settlements. Many issues have contributed to uncertainty about the concession regime. The problems and role of tributary areas and alternative form of long-term concessions should be studied and the incentives needed to support sustainable use understood and incorporated into policies.

4. INA and Land Tenure Policies

INA has a number of policies which have contributed significantly to deforestation. For example, ninety percent of land on cooperative land must be in agricultural production. Perhaps more importantly forest land is considered vacant and subject to expropriation. This has encouraged destruction of forests in favor of cattle production. As reported above, this is land often better suited to timber. Elimination of policies which encourage deforestation should be immediately suspended while guidelines are developed to establish procedures which will appropriate land uses. Alternative rules or systems for INA land conversions should be studied. Clearly institutional capacity will have to be improved to result in improved land use decisions.

5. Stumpage Fee Administration

Stumpage fees are applied to extracted and not standing timber in most cases. As administered the stumpage fees are leading to wasteful resource use. The institutional capacity of COHDEFOR will have to be improved to perform forest assessments and application of the stumpage fee. Further analysis should review

the requirements needed to ensure adequate administration of stumpage fees throughout Honduras. Are their other obstacles to successful implementation of stumpage fees?

Potential Policies

1. Fiscal incentives for reforestation, while a fiscal burden to the government, may be more cost effective than government reforestation projects.

2. The forest fund, currently in draft form, would provide the funds needed to finance incentives for reforestation and better use of forest products. What private sector activities could be aided by fiscal incentives?

5.0 WATERSHED MANAGEMENT

Problem Areas

Water use, quality, and management problems in Honduras are difficult to document with statistical information. Most of the evidence is by observations of particular problems. The water resource is under-utilized. Irrigation development represents only 15 percent of its potential. One factor in this situation has been the low returns to agricultural production which has served as a disincentive to development and management. Hydroelectric power development has at times been harmed by sedimentation from deteriorating watersheds. The government ownership and regulation of water resources is ineffective in controlling pollution and urban waste discharge. These issues can often overlap as is the case with the Choluteca watershed and the effects of development projects on coastal resources. Also of critical importance in this problem area is the interdependent problems of coastal land management, forest use and agricultural development.

Policy Issues

The issues associated with watershed management are quite varied but point to some systematic problems in resource management. The lack of institutional capacity to implement controls or regulations and maintain existing infrastructure undermines many government activities. Policy issues can in part focus on fiscal issues associated with recurrent costs and allocation of public expenditure. There will, however, always be a need to establish priorities among problems and policy choices. The information needed to make those choices is often scarce. Nevertheless systematic inclusion of environmental information as designed into the proposed environmental law can begin to address issues which can improve sustainable management and hence, in the long-run, improve the ability of the government to address economic development projects.

1. Coastal Land Concessions

Legislation prohibits or restricts mangrove use. Nevertheless, control and management of mangrove forests are ineffective. Numerous agencies have

responsibilities which conflict and concession procedures are long. There are many, often conflicting, uses for mangroves including fuelwood, fish and shrimp larvae production, salt ponds, and shrimp farms. These resources may also be affected by agricultural, urban and industrial pollution from the Choluteca river. It will be necessary to study the complex interdependence between various users of coastal resources as well as incentives needed for sustained use of resources. The economic and environmental trade-offs between users as affected by policies will need further analysis as well.

2. Pollution Regulations

The Fisheries law prohibits all noxious waste discharges into water. Other legislation is similarly structured. However, control of pollution is minimal and fines are inadequate. The permit system is ineffective. The need for foreign exchange is encouraging mining activities but environmental controls are inadequate. Some pollution, heavy metals for example, persist in the environment for a long time. Prohibitions in this case are reasonable policy tools. However, regulatory authority has not been managed well and methods will need to be studied to improve performance. With other forms of pollution alternatives should be studied including the relative ease of either standards or taxes.

3. Irrigation Management and Development

Irrigation development in Honduras is limited and concentrated in the private sector. Much of the public sector systems operate at 30 percent efficiency and suffer the problems of recurrent costs common with irrigation systems in many developing countries. The proposed Choluteca project would significantly increase installed irrigation in the public sector but may also have downstream effects on Gulf of Fonseca activities. Irrigation potential has been undeveloped because of short-term trade versus production focus of the economy and government fiscal problems and priorities, among others. Policy issues for further study include economic incentives for improved irrigation management, including the pricing of water. The effects of improved agricultural prices on irrigation development and the potential for reducing pressure on the agricultural frontier should also be studied: Can an increase in properly managed irrigation development contribute to a reduction in the pressure on marginal agricultural land conversion? This would include examination of the beneficiaries and other equity issues. In addition, potential pesticide run-off from the Choluteca project should be assessed since both economic and environmental effects could be significant.

4. Hydroelectric Management and Development

Watershed management activities have not been an important element of hydroelectric planning or a government priority. Problems developed very quickly for the El Nispero dam, severely reducing its economic life. Only now is a watershed management strategy being developed for the important El Cajon dam watershed. It will be necessary to examine the types of policies and regulations which determine the scope of environmental and benefit/cost analysis applied to hydroelectric projects. Inclusion or application of such analysis when properly performed should isolate environmental and economic problems of such projects. These issues should also be assessed within the context of rural versus urban

electrification.

5. Water User Fees

Two fees for the use of water exist: one water user fee for agricultural uses and one surcharge for irrigation districts. Only two percent of agricultural users are registered and collection of the fee is restricted to very large users. The fee and surcharge collect little revenue because of inadequate administrative capacity and low rates, among others. However, the potential for these fees to contribute to revenues is quite large. A review of water ownership policies to determine incentives needed for better water use should begin a process which should include examination of alternative water ownership systems as well as, more narrowly, improvements in the administration of the current fee structure and costs and benefits of the fees. Information can be brought to bear from other developing countries on these water pricing issues.

Potential Policies

1. Pollution taxes would make the polluter responsible for costs now transferred to others. Administration of such a system or various alternatives to pollution taxes might prove easier to administer than prohibitions have shown themselves to be.

2. The Environmental Law which has been under consideration since 1985 requires environmental assessments which at a minimum focuses attention on the potential environmental trade-offs.

3. The Natural Resources Code under discussion by the Callejas government would unify many resource management activities affecting all resource problem areas. This process has the potential of resolving some of the administrative issues and overlapping and conflicting institutional responsibilities.

6.0 WILDLANDS AND BIODIVERSITY

Problem Areas

The wildlands and biodiversity problems of Honduras include parks and reserves, endangered species protection and other aspects of the protection of biodiversity. Little research has been done on the quantity and quality of wildlife species in Honduras. Sketchy and undoubtedly incomplete data suggests that there are approximately 663 bird species, 195 mammal species and 208 reptile species. Estimates for fauna species reach 5000 of which 148 species are native to Honduras. The area in national parks and reserves totals 2,331,100 ha. These estimates represent approximately 20 percent of the area of Honduras.

Wildland and biodiverisy problems in Honduras are severe. The system of 52 parks and reserves has minimal management. Just 5 parks or reserves have any significant staff. These still do not represent effective control. Endangered species have no protection even though Honduras is a member of CITES. Other agricultural activities including modern agriculture and mariculture can

negatively affect local wildlife conditions. Pesticide effects can occur well beyond the bounds of their initial area of use.

Policy Issues

One cannot examine the issues associated with the protection of wildlands and biodiversity without being struck by the contrast between what has been legally established and actual performance in meeting those commitments. The problem is exacerbated by multiple legal and institutional authorities which overlap and conflict but are often irrelevant to what actually happens to these resources. Unfortunately, the loses of unique resources and wildlife are frequently irreversible. Furthermore, wildlife issues are perhaps the most extreme case of intergenerational resource interdependence. Policy reform in this problem area, as well as the others, will require a better understanding by the public of the consequences of these destructive activities. Methods will have to be developed to make short-term and long-term resource and economic decisions compatible.

1. Multiple Agency Responsibilities for Parks and Reserves

The Rio Platano Biosphere Reserve includes activities by SRN, RENARE, AHE, COHDEFOR, INA, among others. This is but one example of many different institutional authorities which influence different parks and reserves. Conflicting institutional objectives and lack of coordination and cooperation by these institutions inhibit park management and is wasteful of scarce resources. These conflicting policies should be studied as they affect both parks and buffer zones. Recommendations should resolve whether one institution should have responsibility for a particular park or reserve. The present ad hoc system of paper parks does not lead to adequate management

2. Multiple Park Legislation and Lack of Regulations

There are at least ten separate laws creating various parks and reserves. Many do not have regulations. This issue is a companion and concomitant issue to the multiple agency responsibility but deserves separate attention because of the lack of criteria used in determining the creation of parks. Does the current park system adequately address the biodiversity needs of Honduras? If so, it is more or less accidental. Policies should be analyzed, including unified legislation and administration, which can increase effective management and protection of parks. This includes fiscal requirements and addressing tenure and buffer zone issues.

3. INA Policies

INA has developed settlements inside of existing parks such as Lake Yojoa and Rio Platano. While it may be relatively easy on paper to change these particular activities by INA, land tenure and distribution issues will continue to put pressure on resource use. Therefore, studies should include buffer zone policies. This could include successful examples from other countries. It is also clear that studies of alternative policies for settlements by INA will be needed.

4. Quotas and Endangered Species Exports

Reported official and unofficial exports of endangered species, especially parrots, are very high. Despite membership in CITES and existence of quotas, control has been poor. For this reason President Callejas has banned all exports pending further study. By CITES treaty obligations some endangered species are banned from export. Policies to address deeply rooted resource problems will have to be successful to prevent irreversible loss of species or habitat. Policy studies of alternatives that reduce trade in endangered species should include taxes and education.

5. Agricultural Practices and Biodiversity

Policies which lead to greater pesticide use and mono-cultural agriculture can cause local wildlife problems. While evidence of wildlife effects from pesticide use do not exist, domestic cattle have been shown to have high pesticide residue levels. While intensive agriculture can reduce pressure on the agricultural frontier, local populations and habitats can be harmed. Studies of policy incentives for habitat preservation within agricultural development areas may lead to amelioration of some of the negative effects. The process of accounting for these effects will not be easy. Even though the relationship between post larvae shrimp, mangrove forests and shrimp mariculture are understood, resource use decisions by the shrimp industry, local fishermen and other mangrove users are presently causing problems for commercial shrimp production.

Potential Policies

1. Debt-for-nature swaps can allow a means to provide for protection of critical natural areas and contribute to their protection. President Callejas has announced interest in developing this option.

2. Conservation stamps or an environmental tax on resource based exports such as timber might help to pay for improved resource management activities.

7.0 CONCLUSIONS

The policies discussed above are representative of a large number issues addressed in this inventory. While the discussion has been organized around a set of taxonomies for both problems and policies, these policies have cumulative, interactive and interdependent effects. Those effects have been noted where appropriate in the text. It will be necessary to take into consideration other policies when analyzing a given priority policy. Not to do so can lead to unintended effects when new policies are implemented.

Short-run and long-run economic and environmental trade-offs, when they are understood, present difficult choices to decision makers. Analysis of policy options for resource and environmental problems will generally have to be concerned with such issues even though greater knowledge may make political decisions harder to make as the losers and winners are identified in an intra-generational and inter-generational sense.

Policies will have to be designed to influence decisions and incentives at the resource user level. Often policies exist which have perverse effects on resource decisions by, for example, making sustainable resource management practices more expensive than resource mining. This will be a challenge to policy design in Honduras since much of the rural population lives in extreme poverty and does not have access to good land.

Over time and by historical tradition Honduras as a state has assumed the ownership of most of its resources. Neither the central or local governments, however, can manage or control the use of these resources. This lack of control has, in part, increased the rate of renewable resource depletion and allowed pollution, although regulations exist which prohibits such activities. Other ownership arrangements will be needed to assure successful resource management.

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VOLUME II

INVENTORY

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The views expressed in this report are those of the authors. They do not necessarily reflect the views of U.S.A.I.D. or the Government of Honduras.

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ABSTRACT

Under the Regional Environmental and Natural Resource Management Project (RENARM), the U. S. Agency for International Development/Regional Office for Central American Programs (USAID/ROCAP) funded country case studies of policies that influence the management of natural resources and the environment. This report presents the results of the Natural Resource Policy Inventory for Honduras. The field work occurred in March and April of 1990.

Volume I is an Executive Summary. It presents major findings, issues and recommendations. Volume II has five chapters. Chapter 1 provides a description of the natural resource and environmental problems of Honduras. Four general categories are presented: sustainable agriculture, production from natural forests, watershed management, and protection of biological diversity and wildlands. Chapter 2 describes important economic issues in Honduras and describes the policy change situation in early 1990. Chapter 3 describes the public and private institutions which affect resource use and the environment. Chapter 4 presents the inventory results by policy category: macroeconomic monetary, fiscal and trade policies, tenure policies, regulatory and sectoral policies and development and environmental programs. Conclusions and recommendations for reform and further analysis and research appear in Chapter 5.

This report demonstrates the importance of considering the natural resource and environmental effects of economic development policies. Short-term economic gains often come at the cost of long-term economic and environmental costs. This report examines over a hundred policies which have significant effects on the use of natural resources and the environment.

PREFACE

Natural resource and environmental issues arise from a complex structure of economic, social and physical interdependencies. The role of policy in determining the use of resources and the state of the environment is also complex and a realtively new area of inquiry. In order to begin changing the resource management regime it is necessary to make a rapid appraisal of existing policies and problems which establishes priorities and narrows the scope of the policy analysis agenda. A policy inventory is designed to meet these objectives. There are five principal steps to performing a natural resource policy inventory:

1. Identification of Problems;

2. Identification of Policies;

3. Identification of Role of Institutions;

4. Analysis and Assessment of Policy Impacts on Natural Resources and the Economy;

5. Identification of Research Priorities and Policy Options to be Studied.

The first step in the process is the identification of problems and organizing those problems into taxonomies which will facilitate the steps which follow. Resource and environmental problems arise when the use of renewable resources exceeds the ability of those resources to be naturally replenished. Uses exceed the capacity for sustained use of the resource. This occurs in Honduras with the over-exploitation or mining of soil, groundwater, timber and wildlife resources, among others. In the case of the wildlife, for example, the losses could be irreversible. Problems also arise when natural resources cannot cope with the level of residuals from human activities such as pesticides, urban wastes and mining. Management of these problems often involve trade-offs between current and future economic and environmental conditions.

This report has defined four problem areas for analysis.

1. Sustainable agriculture issues include land utilization, soil fertility and pesticide use.

2. Production from Natural Forest issues include deforestation, reforestation and forest management.

3. Wildlands and biodiversity issues include endangered species protection, park and reserve management as well as other biodiversity and resource use interdependencies.

4. Watershed management issues include water use, water quality and water management.

Identification of policies also includes the development of a taxonomy of policy types. The taxonomy used for this analysis is derived from a traditional economic framework. Macroeconomic policies are examined within three sub-components: monetary, fiscal and trade policies. When specific policies have fiscal or trade effects on a given problem area, those issues are also included. For example, trade policies will have a general influence on many resource use issues but endangered species trade quotas will address a particular problem. Other policy categories include tenurial issues in control of land, water and trees; regulatory controls over resources and; sectoral and sub-sectoral policies particular to agriculture, forestry, etc. Finally, the overall development and environmental planning process as it addresses or does not address the problem areas is reviewed.

Also included is a description of the principal institutions in the country which affect economic and resource policies. While these institutions are often governmental or quasi-governmental, other institutions are also described. These include significant private sector and industry groups, non-governmental organizations and international agencies. This description provides the basis for understanding the general approach taken to resource management as well as the role and capacity of the various sectors, agencies and institutions.

Analysis and assessment of the effects of policies is a process of understanding the behavioral responses of people using resources. This entails a combination of empirical observation and economic theory. From a practical point of view there is a wide array of indicators for both economic and environmental effects of policy on resource problems. A fundamental question is what are the effects of the policy on short-term as well as long-term economic and environmental conditions. The indicators of these effects will vary with the problem. For example, economic indicators can include commodity prices, fiscal deficits, rural income, tax revenues, among others. Environmental indicators can include, for example, the rate of depletion of soil, forests, wildlife as well as siltation, pollution and toxicity of residues.

The purpose of an inventory is to reach a tentative conclusion about policy effects and reforms and establish an agenda for further analysis and research. Determining those recommendations comes from a process of estimating the importance of a given aspect of a problem area and the policies which have the most influence on the problem and/or the most likely policy subject to change with a refined analysis of options. Those options may well include policies not currently existent in the country but for which some experience in application exists in other countries.

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LIST OF ACRONYMS

ACDI	Agencia Canadiense para el Desarrollo Internacional
ACNUR	Alto Comisionado de las Naciones Unidas para los Refugiados
AHE	Honduran Association of Ecology
AHPROCAFE	Asociacion Hondurena de Produccion del Cafe
A.I.D.	Agencia de los Estados Unidos para el Desarrollo Internacional
AMI	Areas de Manejo Integrado
ANACH	Asociacion Nacional de Campesinos de Honduras
ASCONA	Asociacion Surena para la Conservacion de la Naturaleza
BANADESA	Banco Nacional de Desarrollo Agricola
BANHCAFE	Banco Hondureno de Cafe
BCH	Banco Central de Honduras
CABEI	Central American Bank for Economic Integration
CATASTRO	National Cadaster Service
CATIE	Centro Agronomico Tropical de Investigacion y Ensenanza
CEE	Comunidad Economica Europea
CEFEX	Certificado de Fomento a la Exportacion
CENTREX	Centro de Tramitacion de Exportaciones
CESCCO	Center for the Study of the Control of Contaminants
CETRA	Certificado Transferibles de Opcion a Divisas por Exportacion
CIDA	Canadian International Development Agency
CITES	Convention on International Trade of Endangered Species
COCMA	Committee for the Conservation and Enhancement of the Environment
CODDEFFAGOLF -	Comite de Desarrollo y Defensa de la Flora y la Fauna del Golfo de Fonseca
COHAAT	Cooperacion Hondurena-Alemana de Alimentos por Trabajo
COHBANA	Corporacion Hondurena del Banano
COHDEFOR	Honduran Corporation for Forestry Development
COLPROCAH	Colegio de Profesionales de las Ciencias Agricolas de Honduras
COMCA	Comite para el Mejoramiento y Conservacion del Ambiente
CONAMICH	Comision Nacional de Manejo Integrado de Cuencas Hidrograficas
CONPPA	Comite Nacional de Productores Para Politicas Agricolas
CORFINO	Corporacion Forestal Industrial
COSUDE	Swiss Development Cooperation
CP/H	Peace Corps/Honduras
DRH	Direccion de Recursos Hidricos
EAP	Escuela Agricola Panamericana (Zamorano)
EEC	European Economic Community
ENEE	National Electric Company
ESNACIFOR	Escuela Nacional de Ciencias Forestales
DEC	Direccion Ejecutiva del Catastro
FAO	Food and Agriculture Organization
FECORAH	Federacion de Cooperativas de Reforma Agraria de

	Honduras
FENAGH	Federacion Nacional de Ganaderos de Honduras
FEPROEXAAH	Federacion de Productores y Exportadores Agropecuarios de Honduras
FUSEP	Public Security Force
IDB	Interamerican Development Bank
IHAH	Instituto Hondureno de Antropologia e Historia
IHCAFE	Instituto Hondureno del Cafe
IHMA	Instituto Hondureno de Mercadeo Agricola
IICA	Instituto Interamericano de Cooperacion Agricola
INA	National Agrarian Institute
NGO	Non Government Organization

1.0 BACKGROUND AND SITUATION

1.1 Introduction

The purpose of this chapter is to describe the natural resource and environmental problems of Honduras. Important elements of these problems are influenced by policy decisions which directly and indirectly and by intention and unintentionally increase their severity. These decisions are often taken without adequate understanding of the role these resources will play in the present and future development of the country. Background information on the demographic and economic situation concludes the chapter and will provide the framework in which many of the resource and environmental decisions of Honduras will be taken.

1.2 Natural Resource and Environmental Situation

Overview

Honduras has an area of 112,088 square kilometers. About 80 percent of the total national area is mountainous terrain ranging from 500 to 3000 meters in altitude. More than 75 percent of the country has a grade of greater than 25 percent. The interior highlands comprise about 65 percent of the national territory. Approximately 70 percent of the population live in these areas. Highland valleys hold population centers and some, often extensive agricultural activities. Much of the western, southern, and central mountains are open woodland, supporting mostly pine forest. The ranges in the eastern and northern parts of Honduras are primarily areas of dense, broadleaf forest. Around the highest peaks, remnants of dense cloud forests are still found.

The general pattern of land use in the mountainous interior saves the more fertile and most accessible soils in the valley floors as pasture for livestock and/or commercial agricultural production of export crops. According to the 1974 Census of Agriculture, most of the extensive commercial farms, which used about 55 percent of the total arable land, were larger than 50 hectares. Yet they comprised only four percent of the total number of farms at that time. In contrast, the majority of the small farmers were relegated to small holdings, typically five hectares or less, of the most marginal lands, usually on the steeper slopes. Poor food productivity and low incomes have produced a very low standard of living in rural areas, where illness and poor diets have both been endemic.

Four geographical regions can be described in greater detail (World Bank 1989).

> The southwest region of the country was largely deforested by the early 1900s. It is characterized by poor soils and low and unevenly distributed rainfall, is densely populated and severely eroded. Much of the best valley lands are underutilized and held by cattle ranches. In consequence, small farmers have no option but to farm on the hills. The coffee producers concentrated in Santa Barbara Department constitute an enclave of potentially sustainable, efficient small and medium-scale

agriculture. With the exception of coffee, cattle on valley lands and isolated cases of specialty cropping, the degradation of soil through over-cropping is continuing with the result that population is driven to urban areas or the agricultural frontier in the central and eastern regions of the country.

The central region has better soils, higher rainfall and less broken terrain than the southwest region. It is partially deforested and is the site of both broadleaf and pine forestry operations. Cattle are raised on land cleared from broadleaf tropical forest by transitory spontaneous colonization. As is the case with the southwest region, most of the best valley lands are in cattle which has forced small farmers to farm annual crops on hill lands which should be used for semi-intensive cattle production or forestry.

The Atlantic coast region comprises the alluvial plains of the Sula and Aguan valleys. The region contains intensive efficient milk, banana, oil palm, cacao, sugarcane and pineapple production. There are also extensive cattle operations. This constrains employment opportunities and leaves the rural population with little alternative to occupying badly drained lowlands and the adjacent hills, or moving to the agricultural frontier. Small farmer settlement in the mountains adjacent to these plains has increased the threat of flooding and exacerbated the problems of drainage in the latter area.

The eastern region of Olancho and Mosquitia has only been opened up to forestry and agricultural settlement on any scale since the 1950s. It is predominately forested with some savannah in poorly drained areas. Forests are both broadleaf and pine. There has been rapid expansion of extensive cattle ranching in the area in recent years. In the case of pine lands, once areas have been logged, the forests range may be seasonally grazed. Regeneration of pine can be suppressed by repeated burning and grazing over a three year period, thus converting to extensive degrading pasturage. In the case of broadleaf forests cattlemen may induce spontaneous settlers to clear the forest, plant annual crops for two or three years and then turn the lands over for pasture establishment. The settlers move on to clear new areas. Alternatively, cattlemen may employ the same labor force to clear forest and put the land directly into pasture.

Thus many of the regions of Honduras have interdependent problems of both over-utilization and under-utilization of land. These issues as well as other resource management issues will be examined below. The USAID Natural Resource and Environmental Strategy for Central America (1989) developed a taxonomy of resource problems which will be developed here in the context of Honduras.

Sustainable Agriculture

Soil fertility, land utilization and pesticide use comprise the principal resource issues for sustainable agriculture in Honduras.

> Soil erosion and its resultant productivity losses and siltation in streams and impoundments, and crop and water pollution from pesticide residues are problems associated with agricultural production at both traditional and commercial levels. Chemical residues in beef, seafood, vegetables, fruits and other products represent a potentially serious problem for the growth of export markets for local producers. (USAID/Honduras, 1989)

An estimated 1.9 million hectares are suited to cropping. Of this 1 million hectares are classified as suitable for annual crops and 1 million hectares are suited to perennial crops or pasture. Total area in crops and pasture in 1984 was estimated at 2.3 million hectares.

Exhibit 1.1. gives an approximation of the relationship between land capability and land use. The exhibit suggests that:

1) 1 - 1.5 million hectares of pastures and crops are on land which should be in forest use;

2) An additional 2.3 - 2.8 million hectares have been degraded by shifting agriculture;

3) .6 million hectares of broadleaf forest could be cropped;

4) As much as 0.5 million hectares of pasture land could be in intensive annual or perennial crops. (World Bank, 1989)

According to the 1982 USAID Environmental Profile, eroded areas resulting from deforestation increased from 400,000 hectares in 1972 to 700,000 hectares by 1977.

> Extrapolation of that rate (70,000 hectares/year) would yield an eroded area of 2.4 million hectares by the year 2000. The eroded area in 1987 was estimated at 2.3 million hectares suggesting that the rate has accelerated to 150,000 hectares/year, ie. 4.2 million hectares eroded by 2000 or 40 percent of the country. It is asserted that soil loss in some areas has reached 500 tons/ha/year compared to 2-3 tons/ha/year under forest cover. (World Bank, 1989)

It is difficult to document the relationship between the reduction in yields and abandonment of land as a result of erosion and fertility loss. Average national yields showed an increasing trend over the 20-year period 1965-1984 with rice , corn and sorghum increasing by about 20 percent and bean yields remaining stable. (See Exbihit 1.2.) This is the antithesis of what would be expected. Nevertheless, from 1975-1984, three of seven regions in Honduras showed a declining trend in yields of some crops - sorghum and corn in the west and south, and sorghum in the central-west.

It should be noted that yields in Honduras are still relatively low. It is likely that yields would have been higher if there had been less resource degradation. Other explanations could arise from the various levels of application of technology represented in Honduran agriculture.

The principal sources for this problem is the growing rural population and the highly skewed distribution of land control. Much of the better valley land remains in extensive cattle production. This forces small farmers to use inappropriate and highly erodible hillsides or turn to slash-and-burn conversion of forests which often have poor soils. The contribution of policies to these problems are significant and the subject of later chapters.

Production from Natural Forests

There are three critical parts to both pine and broadleaf forest issues in Honduras: deforestation, forest management and reforestation.

> The management issues associated with deforestation hinge on how lands which are classified as suited only to timber production are used. Estimates of this area are in the range of 8.3 million hectares, or 75 percent of the country of which about 5 million hectares are still in forest. Exhibit 1.1. provides an approximation of how these lands are currently used relative to their capability. Of the 2.8 million hectares of pine forest in 1964, 0.4 million hectares had been converted by 1986 to low grade pasture for extensive cattle production and about 50,000 hectares are in some sort of subsistence annual cropping under a bush-fallow regime. The 2.4 million hectares which remain are being logged at 40,000 hectares annually of which only 25,000 hectares are permitted to regenerate naturally and 15,000 hectares are converted to native pasture. The quality of the remaining pine forest area is steadily deteriorating as the percentage of mature trees suitable for lumber declines - the proportion of mature commercial timber volume to total timber value was reduced from 70 percent to 40 percent over the period 1964-1986. Total volume of pine lumber dropped from 48 to 28 m3 between 1964 and 1986. Projection of the above trends would reduce production to 20 percent of current levels by 2010. In broadleaf forests, 4 million hectares which stood in 1964 have been cleared at an average annual rate of 65,000 hectares leaving 2.6 million hectares by 1986. At this rate the forest would be eliminated by 2025 (World Bank, 1989).

While the potential for sustainable management of pine forests is well documented, little effort is being directed at examination of the long-term economic viability of broadleaf forest. A project by the Canadian Development Agency will take many years to reach fruition. However, neither pine or broadleaf forests are managed for sustainable timber production. Causes of the problem are well known although the degree of one or another cause is subject to debate. For example, there exists some disagreement as to whether fuelwood gathering is a principal cause of deforestation or a secondary activity following other forest destruction activities such as commercial logging and high-grading and land clearing for slash-and-burn agriculture or ranching. Regardless of the exact importance of one versus another source of the problem, many of the root causes remain the same and have been disc

There are many potential management systems to improving forest conditions. Some of these exist. For example, AMI and tributary areas are designed to improve sustained resource use, though management problems have prevented much success. Others management systems are under consideration. This includes private ownership of timber, something currently rare in Honduras.

Reforestation activities have been approached on the basis generally of activities within donor projects. Alternatives will need to be explored to change from the current system of dependence on natural regeneration given the deforestation rates cited above.

Management of Critical Watersheds

Water use, quality, and management problems in Honduras are difficult to document with statistical information. Most of the evidence is by observation of particular problems or occasional case studies. Issues with watershed management include irrigation, hydroelectric power, water pollution and coastal land issues coincident and interdependent with watershed management

The water resource is under-utilized. Irrigation development represents only 15 percent of its potential.The irrigation potential of Honduras is 400,000 to 600,000 hectares of which only 67,000 hectares have distribution infrastructure, much of which is considered to be deficient and operated at only 30 percent efficiency. Most of the irrigation is private. One factor in the limited development of irrigation has been the low returns to agricultural production which has served as a disincentive to development and management.

Hydroelectric power development has at times been harmed by sedimentation from deteriorating watersheds. El Nispero dam was closed after a few years because of sedimentation. Watershed planning for El Cajon dam, the principal source of power for Honduras is just now being completed. Differences of opinion exist as to the severity of sedimentation problems for El Cajon. Causes of watershed problems have been sketched in the discussions of sustainable agriculture and forest management issues above.

Pollution issues are also critical aspects to water resource management. Pollution sources include pesticide run-off, heavy metals from mining and urban and industrial discharges. The documentation of these problems is again quite sketchy and physical information is needed to document the problem. Policy issues center on the failure of the government ownership and regulatory regime to control the use of the resource.

Finally, coastal land management issues include downstream effects of irrigation developments like the proposed Choluteca project. But more importantly there are a set of complex demands from different resource user groups. Various demands placed on mangrove forests include fuelwood, often for salt drying, salt ponds, shrimp farms as well as fishing related activities.

Wildlands and Biodiversity

The wildlands and biodiversity problems of Honduras include parks and reserves, endangered species protection and other aspects of the protection of biodiversity.

Little research has been done on the quantity and quality of wildlife species in Honduras. Sketchy and undoubtedly incomplete data suggests that there are approximately 663 bird species, 195 mammal species and 208 reptile species. Estimates for fauna species reach 5000 of which 148 species are native to Honduras.

The area in national parks and reserves totals 2,331,100 ha. and is elaborated in Table I.3. These estimates represent approximately 20 percent of the area of the country. However, care should be taken to note the large area in forestry reserves. These include areas designated in Olancho for tree production for the Corfino project. Some of this area is already severely degraded. At present 45 percent of the area is deforested, 15 percent is in commercial pine stands, 10 percent is in non-commercial pine and 35 percent in broadleaf forest (World Bank, 1989).

There is a minimal level of actual management for the officially declared 52 parks and reserves. Only five parks have significant staffing. Incursions from nearby communities is common and some government agencies actively encourage developments within park areas.

Wildlife species exports of endangered species is estimated to be severe. While controls via quotas and membership in CITES is in place, there is no effective control. Again the source of the problem is the rural poverty and land distribution. Nevertheless, the export issues is also driven by high demand in developed countries. Of special concern is the export of parrots.

Modern agricultural practices tend to monoculture which destroys biological diversity in a given region. This self-same development may reduce pressure on the agricultural frontier (depending on employment generation, etc.). Thus there will be some trade-offs made both economically and environmentally.

1.3 Demographic, Historic and Economic Backgrounds

This section will highlight the issues mentioned in the analysis above and provide another aspect of the framework from which resource use decisions are made in Honduras.

The population of Honduras is estimated to be 4.3 million people. At least 60 percent of the population live in rural areas. The rural population is large and growing rapidly. This results from a combination of continued high fertility (eight children per household) and decreasing (although still high at 67 per 1000 live births in 1987) mortality. The shift from rural to urban areas within the country, as in many other developing countries, has been intensifying. From 19[illegible] to 1988 rural population grew 48 percent while the urban population grew by 1[illegible] percent. It is estimated that by the end of the decade Tegucigalpa and San Pedro Sula together will account for nearly 75 percent of the urbanized area populat[illegible]

and close to one-fourth of the total population of Honduras.

Per capita income was only $780 in 1987. Malnutrition is the most severe in Latin America, affecting one third of the population and 45 percent of children under five years of age. About half of the population lacks access to safe water, and 75 percent of households lack sanitary waste disposal. One quarter of the population has no access to basic health services; two thirds is inadequately housed; over 40 percent of the adult population is illiterate with higher concentrations of illiteracy in rural areas.

In Honduras, the small minority of wealthy class interest groups has traditionally controlled regional and national wealth, often through ownership of large landed estates. The vast majority of the population is composed of rural small farmers and agricultural laborers who live in growing poverty. (See Table I.4.) During the twentieth century a small group from the middle class has slowly emerged. Although it is moderately well off economically, it has not been very active politically as a group. Because colonial conquest and settlement reduced the native population, the mestizo society of Honduras is relatively homogeneous. There are, however, approximately 508,000 indigenous peoples in Honduras. Although the foreign banana companies and a growing segment of domestic rural entrepreneurs use advanced agricultural techniques, many large landowners engage primarily in traditional livestock raising practices.

As part of the Spanish and colonial heritage, Honduras has always had a highly centralized decision-making process. During the colonial period, the Central American Provinces were ruled as a territory under the jurisdiction of a captain general with powers independent of viceregal jurisdiction. As these colonies became independent, almost as a reaction to centralized government in Guatemala, the newly independent nations formed a highly decentralized, weak federal government, which eventually failed in the late 1830s. The independent republics, including Honduras, each returned to strong, centralized government decision-making. Although some government institutions in Honduras have regional offices, most of the decision making is highly centralized, leaving local governments with little authority.

The economy of Honduras depends on agriculture for approximately 80 percent of its exports. Exports and imports total two-thirds of the GDP. Therefore, sustainable agricultural production and diversification of that production from dependence on coffee and bananas will be important elements to the future size and stability of the economy of the country. Problems of high public expenditure, high internal borrowing and external debt will make some resource use solutions difficult to implement. Nevertheless, recent decisions by President Callejas to float the currency and eliminate many tariffs as well as considering private sector alternatives to activities currently assumed by the government are positive developments. A more detailed description of the structure of the economy and the package of policy changes currently being implemented by the Callejas government appears in the next chapter.

Exhibit 1.1

Approximation of Land Use and Capability

Honduras
(1986)

Current Land Use	Land Use Capability (million ha) Forest	Cultivable	Other[a]	Total
Broadleaf forest	2.02	0.63	-	2.65
Pine forest	2.40	-	-	2.40
Eroded forest lands	2.33[b,e]	-	-	(2.82) 2.33[f]
Native pasture (on farms)	0.40[c]	0.10	-	0.50
Crops	0.63[d]	0.65	-	(0.79) 1.28[f]
Pasture (artificial)	0.50[d]	0.52	-	1.02
Other[a]	-	-	1.03	1.03
Total	8.28[e]	1.90	1.03	11.21

Source: World Bank, 1989.

a/ Urban, swamp and mangroves.
b/ Most of this area is under a bush-fallow regime on former broadleaf forest lands.
c/ The majority of this area is on former pine forest lands.
d/ The greater part of this area is on lands formerly in broadleaf forest.
e/ Estimates of land suited only to forest range from 6.3 million ha to 9.3 million ha depending on interpretation of 3 million ha classified for "very extensive" use which may include agro-forestry of native pasture. SECPLAN estimates 7.4 million ha which should be retained in forest. The figure adopted (8.28 million ha) is a residual after substraction of "cultivable" and "other" uses.
f/ Area in crop in 1987 estimated by SECPLAN was 1.28 million ha. Area estimated by IICA for 1984 was 0.79 million ha. Depending which estimate is accepted, the residual estimate of "eroded forest lands" would be 2.33 or 2.82 million ha. COHDEFOR uses a figure of 1.4 million ha in degraded cut-over forest lands.

Exhibit 1.2

YIELDS OF PRINCIPAL CROPS
(TM/Has)

Year	Corn	Beans	Sorghum	Rice	Potatoes	Cassava	Year	Onion	Garlic	Tomatoes	Cabbage	Pineapple	Melon
1970	1.20	0.60	1.27	1.30	6.81	7.22	1970	3.67	2.40	4.79	6.53	4.60	2.77
1971	1.20	0.56	1.26	1.33	7.17	6.99	1971	3.83	2.22	5.20	6.30	5.09	2.57
1972	1.20	0.53	1.25	1.35	7.55	3.98	1972	3.55	2.05	5.55	6.09	5.63	2.39
1973	1.19	0.55	0.77	1.47	5.45	3.42	1973	2.60	1.10	4.54	2.33	9.66	1.77
1974	1.03	0.45	0.67	1.16	5.45	3.20	1974	3.39	1.71	6.12	2.07	10.67	1.65
1975	1.08	0.44	0.94	1.67	5.44	2.99	1975	3.26	1.56	4.73	2.09	11.80	1.53
1976	1.02	0.41	0.72	1.53	5.42	2.79	1976	3.15	1.42	4.84	2.12	11.43	1.42
1977	0.97	0.38	0.54	1.51	5.40	2.61	1977	3.06	1.27	4.94	2.15	11.20	1.32
1978	1.24	0.54	0.72	1.86	7.17	2.87	1978	3.34	1.40	5.14	2.55	11.93	1.37
1979	0.98	0.48	0.60	1.65	10.64	5.56	1979	3.76	1.43	17.34	8.42	9.56	4.80
1980	1.14	0.53	0.84	1.83	13.50	5.20	1980	4.80	1.40	9.26	7.99	44.22	4.10
1981	1.42	0.55	1.00	1.73	10.38	8.14	1981	4.67	4.00	9.63	9.44	40.20	4.08
1982	1.35	0.60	1.28	1.46	12.77	18.62	1982	4.52	3.44	11.87	8.15	42.95	4.18
1983	1.49	0.60	0.91	2.13	10.90	3.26	1983	5.18	n.a.	n.a.	9.29	n.a.	n.a.
1984	1.38	0.56	0.88	2.72	n.a.	3.14	1984	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1985	1.47	0.57	0.89	3.13	n.a.	3.14	1985	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1986	1.40	0.59	0.44	4.10	n.a.	3.14	1986	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	1.44	0.63	1.15	1.96	n.a.	n.d.	1987	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1988p	1.32	0.67	0.54	3.97	n.a.	n.d.	1988	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Annual growth rate (%)	0.6	0.6	-4.7	6.4	4.0	-6.4 (%)		2.7	3.0	7.9	2.7	20.5	3.5

Source: ADAI/APAH Data Bank

Exhibit 1.2 (Cont.)

YIELDS OF PRINCIPAL CROPS
(TM/Has)

Year	Watermelon	Banana	Plantain	Coconut	Sesame	Sugarcane	Year	Raw cotton	Cotton fiber	Coffee	Oil Palm	Tobacco
1970	4.46	41.27	17.14	5.19	0.69	29.55	1970	1.75	0.63	0.39	7.39	0.86
1971	4.71	58.41	16.77	5.12	0.68	30.50	1971	1.76	0.63	0.40	9.19	0.86
1972	5.07	53.95	17.48	5.06	0.67	31.48	1972	1.68	0.60	0.41	9.29	0.87
1973	7.07	55.29	6.75	4.30	0.69	33.62	1973	1.59	0.57	0.41	9.57	0.87
1974	7.42	45.92	6.81	4.11	0.66	34.71	1974	1.77	0.63	0.42	8.55	0.87
1975	7.80	30.39	6.87	3.92	0.65	32.41	1975	1.90	0.68	0.42	6.68	0.86
1976	8.19	41.62	6.94	3.75	0.64	33.55	1976	1.93	0.69	0.43	6.44	0.86
1977	8.61	47.18	7.01	3.58	0.63	34.72	1977	1.79	0.64	0.44	4.30	0.86
1978	9.10	46.90	7.11	3.96	0.72	39.07	1978	1.77	0.63	0.52	3.35	0.86
1979	14.42	53.84	15.55	3.93	0.38	59.68	1979	2.22	0.79	0.38	3.29	0.87
1980	6.84	56.94	15.16	4.06	0.75	31.05	1980	2.48	0.88	0.61	4.64	0.87
1981	3.73	57.14	8.12	3.42	1.07	53.98	1981	2.32	0.83	0.59	5.30	0.87
1982	3.98	58.86	7.02	2.73	0.91	54.60	1982	1.87	0.67	0.61	6.90	0.87
1983	n.a.	45.86	11.86	n.a.	0.82	35.06	1983	2.85	1.02	0.60	8.35	0.87
1984	n.a.	48.69	13.14	n.a.	n.a.	54.26	1984	2.35	0.84	0.59	12.65	0.75
1985	n.a.	52.58	13.89	n.a.	n.a.	53.22	1985	2.01	0.72	0.61	15.23	0.75
1986	n.a.	51.51	14.00	n.a.	n.a.	65.08	1986	2.17	0.77	0.62	14.43	0.75
1987	n.a.	61.38 e	16.40	n.a.	n.a.	70.87 e	1987	2.01	0.72	0.66	14.91	0.78
1988	n.a.	18.88 e	15.41 e	n.a.	n.a.	65.41	1988	1.94	0.66	0.77	15.00	0.75
Annual growth rate (%)	-1.0	2.4	-0.3	-5.2	1.3	5.3 (%)		0.8	0.8	3.1	4.2	-0.6

Statistical Yearbook 1980, 1983 (years 1970-1982)
S.R.N. Statistical Summary 1988 (SECPLAN) years 1983-1986
Cotton: Southern Region Cotton Producers
Oil palm and tobacco: Honduras Central Bank
(Worksheet of April 27, 1989)
Cattle products: Honduras Central Bank
Basic Grains: S.R.N. Statistical Summary, Volume I, 1984 (years 1970-1979).
S.R.N. Statistical Summary 1988 (years 1980-1986).
D.G.E.C SECPLAN Basic grains harvest forecast
(years 1987-1988)

Source: ADAI/APAH Data Bank

Exhibit 1.3

Honduras National Parks and Reserves, 1990

Natural forest	31 reserves	334,000 ha
Island and coastal zones	10 "	2,000 ha
Wetlands	10 "	150,000 ha
Lakes	1 reserve	100 ha
National monuments	26 reserves	--
Concessions to indigenous ethnic groups	22 "	(no estimate)
Production forest - humid	5 "	200,000 ha
pine and mixed	5 "	1,645,000 ha
Total	110 reserves	2,331,100 ha[1]

Source: The World Bank, Draft, 1989.

1/ Area excludes concessions to ethnic groups.

Exhibit 1.4

SOCIO-ECONOMIC STRATIFICATION BY STRATUM AND SUB-STRATUM OF THE INCOME, NUMBER OF HOMES AND INHABITANTS NATION-WIDE, 1985

Income Stratum	Income Sub-stratum	Number of homes	%	Number of inhabitants	%
Low	Extreme poverty	318,137	49.7	1,985,243	55.6
	Poverty	147,531	23.1	795,342	22.3
	Low	61,112	9.5	297,615	8.3
Medium	Medium low	30,137	4.7	143,112	4.0
	Medium	21,572	3.4	96,644	2.7
	Medium high	16,108	2.5	68,102	1.9
High	High	9,675	1.5	41,781	1.2
	Very high	35,680	5.6	144,176	4.0
TOTAL		639,952	100.1	3,572,015	100.0

Source: Permanent Home Survey for Multiple Purposes. Technical Paper No. 6. Ministry of Planning and Budget. Bureau Statistics and Census. Tegucigalpa, Nov. 16-18, 1988. As appears in Draft "Perfil Ambiental", 1990.

2.0 ECONOMIC BACKGROUND AND RECENT POLICY CHANGES

2.1 Economic Background

In the 1970s and 1980s Honduran governments attempted to accelerate economic growth and to raise export earnings by investing large sums in physical and social infrastructure and by implementing a wide range of development programs intended to diversify the economy. Moreover, the public sector began to rely heavily on external funding to finance these projects. Problems of administrative mismanagement and misappropriation limited government achievements. In general, public sector institutions have been strongly criticized for inefficient use of investment resources and high operating costs due to overstaffing and inflated salaries. Wasteful administrative mismanagement and corruption were often critical factors in the failure of public enterprises.

Agriculture is the most important segment of the Honduran economy. The sector provides many of the raw materials used in manufacturing and regularly generates at least 75 percent of export earnings. Honduran agriculture is divided into three productive sectors. Most agricultural activity transpires within a traditional sector that is composed of small peasant farmers and large landowners. This sector coexists with a smaller but more efficient branch of agriculture comprising large modern enterprises employing advanced technologies mainly to produce a variety of export products. There is also an agrarian reform sector characterized by rudimentary technology and production conditions.

The role of agriculture in the economy of Honduras is critical to understanding fluctuations in many indicators of national economic well-being as well as effects on the uses of natural resources. Agricultural production accounts for over 80 percent of the exports of the country. It employs over 50 percent of the work force compared to 14 percent each for manufacturing and services. Bananas and coffee account for approximately 60 percent of total exports. All of the agricultural exports are vulnerable to world market price fluctuations and weather conditions. Changes in these variables can dramatically affect the economy. For example, in 1987 the price of coffee dropped 41 percent and caused a reduction of foreign exchange revenues of almost 4 percent of GDP, equivalent to about one sixth of the exports of the country. Other external factors which affect exports include international arrangements such as sugar quotas.

Estimates by the Central Bank of Honduras, IMF and USAID. based on World Bank projections suggest stable and moderate growth in agricultural exports and prices until 1992. Non-agricultural components of exports, though not detailed, are expected to also increase at annual average rates around 4.7 percent between 1988 and 1992 according to this prediction. Revenues from exports are projected to increase at annual rates of 6.8 percent for 1988 - 1990 and 7.2 percent from 1990 - 1992. The current economic situation also raises skepticism about the projections.

Exports and imports represent almost two-thirds of the GDP of Honduras. Within the context of an estimated national population growth rate of 2.9 percent, the economy of Honduras will need to expand in order to improve the

standard of living of the population. From 1980 - 1986, however, real income per capita declined. Estimates of real per capita income and the real growth rate of the GDP show improvement for 1987 and 1988 (4.4 and 4.6 percent, respectively).

Exports and imports play a critical role in the economy of Honduras. The balance of trade deficit, while declining slightly in recent years demonstrates a persistent long term problem. Diversification of exports within agriculture as well as non-agricultural product diversification is needed to stabilize export dependence on coffee and bananas.

The cattle industry is an important component of the Honduran economy. Sales of refrigerated meat have been an important but declining element in exports. Some diversification is occurring with seafood exports and agricultural products such as strawberries, melons, cantaloupes, cucumbers and others. This export diversification will be needed to stabilize the export and foreign exchange earnings of the country.

The availability of foreign exchange derived from agricultural exports affects its availability for imported goods used as inputs into industrial production. Export earnings affect the income of the central government and ultimately the amount of capital available.

Public expenditures have been increasing relative to receipts. During 1987 Honduras was unable to continue on-time payment of its external debt because of a lack of foreign exchange. Negative external financing contributed heavily to the shortage of foreign exchange. The balance of payment difficulties are rooted in: 1) the overvaluation of the exchange rate and, 2) the lack of dynamics in its exports and the excess demand for imports that resulted from expansionary monetary policies. In 1987 there was a 20 percent rise in the money supply caused by the need to domestically finance the public debt. Public investments necessary to foment development will become even scarcer unless revenues increase by, among other things, an improvement in exports. tariff reforms and tax reforms.

At the beginning of 1989 and continuing into early 1990 there was illiquidity in the capital market. The reserve requirement of the Central Bank was increased to 35 percent on all deposits and checking accounts: 15 percent for savings and loan associations, and 20 percent for deposits in foreign currencies. These requirements have not only controlled domestic liquidity but have also allocated a large and increasing share of domestic deposits to finance the fiscal deficit at low or zero rates of interest. Therefore loans to the private sector have been scarce or expensive.

The devaluation of the official exchange rate (2:1) in March 1990 will have a number of effects. The difference which existed between the official and unofficial exchange rates hurt exporters who are implicitly taxed by that overvalued currency. Importers, on the other hand were implicitly subsidized by the overvalued currency. The devaluation will benefit exporters and hurt importers in the short run. The situation will be more complicated for export products which depend in part on imported inputs for their production. Devaluation will make Honduran exports more competitive but will also raise the

cost of imported goods and inputs. Trade protection measures for domestic industries have compounded the problem. Limited access to foreign exchange can particularly affect industries in Honduras because of the dependence of the manufacturing sector on imported inputs. There is also apparently a substantial amount of capital flight in response to the exchange rate situation, interest rates and overall uncertainty in the economic situation.

In addition to a serious disequilibrium in the balance of payments and a large government debt financed through the domestic financial system, there are government policies which have distorted interest rates and the credit allocation process. The attempts by the government to control lending interest rates at unrealistically low levels has aggrevated credit rationing. Since price is not used to ration credit other techniques are used. Although the ceiling on interest rates (now at 17%) is low in real terms it still introduces serious distortions in the determination of free market interest rates. Moreover, based on special mechanisms and privileges, the public sector squeezes out the private sector, absorbing an increasing share of the available credit. Financial institutions in such circumstances are very conservative in their lending practices since they are not receiving a risk premium for their loans. This will also constrain loans to short-term, rapid turnover situations.

Several other factors are important to understanding the macro-economic environment in Honduras. Unemployment is very high, approaching 30 percent in one estimate. Underemployment is also very high. It is quite clear that such high levels of unemployment and underemployment nationally reflect significant economic problems and a source of social instability. According to the annual report of Banco Continental, "Honduras needs to reduce consumption, a very difficult task since our standard of living is already low. We also need to increase our savings rate, which is difficult because of high unemployment. Without these two ingredients we cannot initiate a continued economic development process." (Banco Continental, 1988, p.10)

2.2 Summary of Policy Changes Approved by the Government of Honduras in 1990

A comprehensive set of economic changes have been instituted by the Callejas government. (These changes have been occurring on an almost daily basis during the time of the natural resource policy inventory.) While the policies being implemented will be discussed in detail elsewhere, a brief summary here will provide the reader with an understanding of the scope of this dynamic situation.

Article 328 of the Constitution of Honduras mandates that the Honduran Economic System be based on the principles of efficient production and social justice in the distribution of wealth and national income. Taking this into consideration the Callejas government has determined that:

1. It is of national interest to adopt structural adjustment measures in the public finances in order to strengthen the national economy and increase the production and productivity of the agricultural, handicrafts and industrial sectors; and

2. It is necessary to rearrange the Government's finances to reduce the

fiscal deficit, which is having a negative influence in the Honduran economy through creating an inflationary process, and to devalue the lempira. Therefore, the Government issued a Structural Economic Adjustment Law in March 1990.

Other changes are as follows:

Import Tariffs

- All tariff exemptions on the importation of merchandise, even those established in general or specific laws, are abolished.

- All fiscal exemptions granted to private volunteer non-profit organizations of public interest are abolished.

- All the exemptions based on international conventions with diplomatic corps, and duly proven donations to meet the priority needs of the population in the areas of health, food, education and employment generation, are exempt from the above regulations.

- Henceforth, the import tariffs will be applied on the lempira value of the merchandise, resulting from applying the Customs Valuation Factor, which is based on the banking system exchange rate, which in turn is established by the Central Bank of Honduras on the basis of the supply and demand for foreign exchange.

- All tariff surcharges are abolished, except the 10% surcharge on CIF value of all imports, and 5% on CIF value for customs services. Exempt from the 10% surcharge are basic products such as raw materials, food, medicines, fertilizers.

- The sales tax will be collected at the moment of clearing customs.

- The import taxes on merchandise that were expressed as a percentage of the CIF value in Title I of the Import Tariffs in Decree No. 213-87, dated November 29, 1987 (Brussels List) are modified as follows:

Tariffs will be reduced gradually every year until they reach the tariff level established for 1992, as follows:

Goods with a former tariff equal or higher than 45% on the CIF value will pay 40%, 35% and 20% in 1990, 1991 and 1992, respectively; those with a former tariff in the range of 30% to 44% will pay 30%, 25%, and 20% in the three years, respectively; those in the range of 16% to 29% will now bear a tariff of 15% during the three years; those in the range of 10% to 15 will now pay 10% during the three years; and tariff rates of 2%, 4% and 5%, for the three years, will be charged to those items that had tariffs of less than 10%.

Exempt from the above modifications are fuels, which will be subject to a 20% tariff on the CIF value.

According to this law, fertilizers and agrochemicals will pay 2%, 4%, and 5% in 1990, 1991 and 1992, respectively. This was established as a way to respect the thrust of the Decree on Incentives to the Production of Basic Grains (passed in May of 1989), that states that these products will have a 1% tariff.

Export Taxes

The export taxes are still in force. However, the scale of rates will be established as a function of the lempira value of the product, calculated in accordance with the banking system rate. For example, formerly coffee exports paid taxes if the price were higher than Lps. 200.00 per hundredweight, that is, on prices higher than US$100. Now that minimum price has been reset at Lps. 400 per hundredweight.

In addition, a temporary tax has been levied on extraordinary profits on exports, resulting from the valuation of those exports based on the Customs Valuation Factor. In 1990 this tax will be 12% for traditional exports and 9% for non-traditional. For traditional exports, this tax will be reduced gradually by 1% in every month of 1991, so that by December, 1991, the traditional exports will pay 1%. Non-traditional exports will be exempt from this tax starting in July, 1990.

Income Tax

The income tax for legal entities has been fixed as follows:

1. Taxable net income up to Lps. 100,000: 15%
2. Taxable income higher than Lps. 100,000: 35%

The income tax under provision 1. will be applicable only to those enterprises that are not part of a consortium or group of companies, nor to companies formed by blood relationships up to the fourth degree and second degree by marriage. This law abolishes all deductions due to reinvestment of profits which were granted by special laws, such as the Industrial Promotion law. In relation with to the personal income tax, the net taxable income scale was modified, so that now incomes below Lps.10,000 are exempt from income tax. This law allows for the income tax exemptions specified in other laws. Such is the case for the cooperatives and some industries. It is expected that this tax will be modified in three more years, in order to eliminate these exemptions.

Sales Tax

This tax was increased from 5% to 7% on the goods that are subject to it, and to 10% on sales of liquors, cigarettes, and tobacco by-products. Food and medicine are not subject to this tax.

Production Tax

The tax on production with specific rates is converted to its equivalent in ad-valorem terms, calculated on the factory sales price at the moment this law was issued.

Other Regulations Now Abolished

- Decree 113 of April 2, 1987, establishing a tax on the sale of livestock slaughtering permits.

- Decrees Nos. 230-83 and 61-87 containing export promotion laws.

Monetary Policy

Under the present economic adjustment policy, the exchange rate policy has been modified to recognize officially the parallel market, and to establish the Customs Valuation Factor, which also is based on the supply and demand for foreign exchange. As of this writing, this factor has been set by the Central Bank at Lps.4.00 per US$1.00.

In addition, the banks that have been authorized to participate in the exchange market may buy foreign currency at a price within a band of percentage variation established by the Central Bank for the Customs Valuation Factor. To date, this factor is 2.5% (plus or minus) and the banking system rate for purchasing dollars is Lps. 4.10 per dollar and Lps. 4.16 for selling dollars. Both rates include the banks' commission (1.5%).

This new exchange rate system is equivalent to a devaluation, establishing a floating exchange rate system with bands, which probably will turn out to be a crawling peg.

The foreign exchange market is under administrative controls. Sales of foreign exchange in amounts up to US$3,000 can be made directly through the banking system by submitting the vouchers listing the uses to which the foreign exchange will be put. All amounts exceeding US$3,000.00 require authorization from the Exchange Department of the Central Bank. The self-financing requirement has been eliminated and now the importer submits to Customs the exchange voucher issued by the bank in order to have his imported merchandise registered for accounting purposes.

Sectoral Measures

The decision was taken to privatize the IHMA silos, as well as to free the basic grains imports. Also, studies are being carried out to modify IHMA's function, in order to abolish the system of guaranteed prices based on production costs. These are being replaced by price bands based on the international price plus transportation and internal marketing costs, and by a 30% tariff to protect the producer from the fluctuations of international prices and protectionist policies of the developed countries.

Studies are also underway to privatize the production of improved seeds, which was previously carried out by the Ministry of Natural Resources. Several other public enterprises are being privatized as well, including the two state-owned sugar mills, the dairy plant, and the National Livestock Center.

2.3 Conclusions

These policy developments provide a backdrop for understanding the role of institutions described in the next chapter as well as providing detail pertinent to the inventory results. The policy environment is especially dynamic. Nevertheless, many of the economic policy changes are being made without adequate consideration of the natural resource and environmental effects of those changes. However, those effects have not been widely studied nor are they well understood in any country.

3.0 DESCRIPTION OF POLICY ROLE OF INSTITUTIONS

The process of assessment and analysis of policies cannot take place without an awareness of the institutions associated with the policy issue. These institutions have responsibilities which affect many natural resource and environmental problems and issues. The purpose of this chapter is to describe institutions in the Honduran framework and the primary policies affected by those institutions.

3.1 Macroeconomic Monetary Policy Institutions

Interest rates, exchange rates and money supply policies are analyzed, selected, issued, promulgated, directed, monitored and enforced by the highest monetary authority, the Board of Directors of the Central Bank of Honduras. This Board of Directors is composed of five members: the President of the Central Bank, the Minister of Finance, the President of BANADESA, a representative from the private bank sector, and a representative of private enterprise. The policies issued by this governing body are implemented through the commercial and developmental private and state banks, as well as by savings and loan associations.

The formal banking system is composed of 14 commercial, private banks; 3 state banks; and 7 savings and loan associations. In addition, there is a substantial informal credit system constituted by individual lenders, businesses and others.

Exchange rate policies are set by the Board of Directors of the Central Bank and implemented by the entire banking system. Money supply, as a result of monetary policy, also falls under the Central Bank's control. However, important money supply issues do not fall under the effective control of the Central Bank: these include exports and government expenditures. Domestic credit growth and the effects of higher inflation have had a direct impact on long-term investments and the maintenance and improvement of the resource base and the productive capacity of the private sector.

3.2 Macroeconomic Fiscal Policy Institutions

Public expenditures are budgeted by the Planning Ministry (SECPLAN) and implemented by the Ministry of Finance. SECPLAN prepares the national budget based on the estimates of the government's income and the domestic credit for the public sector (said amount established by the Central Bank, based on import, export and capital income estimates). The Ministry of Finance collects taxes and is responsible for fund allocations according to the national budget, which in turn, is prepared by SECPLAN and approved by the National Congress.

Public expenditure, fiscal deficit and external debt have important effects on natural resources. These are policies that, under the political guidelines, orientation and limits placed by the Chief Executive, are prepared by SECPLAN and the Ministry of Finance, analyzed and selected and/or recommended by the Economic Cabinet (composed of the President of the Central Bank, the Minister of Finance,

the SECPLAN Minister, the Minister of Natural Resources, and the Minister of Economics and Trade), approved by Congress via the budget or loan agreements, and implemented by the Ministry of Finance. Other institutions, such as the Central Bank, have less control over government activities on fiscal debt and public expenditures, which generally come out of SECPLAN and the different government institutions, and are implemented by the Ministry of Finance.

The Economic Cabinet, following the political guidelines of the Chief Executive, with final approval from the National Congress, analyzes, selects options, recommends, and promulgates policy on income taxes and tax incentives. Although the President of Honduras provides leadership in the political guidelines for the policies adopted by the Economic Cabinet, he does not directly participate in its deliberations. The implementing institution, that directs, collects, monitors, manages and enforces these policies is the Ministry of Finance.

Other macroeconomic/fiscal policies that have an incidence on the natural resources of Honduras are resource-use related: stumpage, water user, surcharge, distributive, and hunting fees. The institutions associated with directing, supervising and enforcing stumpage fees are the Honduran Corporation of Forestry Development (COHDEFOR), in the public sector and sawmills and logging contractors, in the private sector. Water-related fees for agriculture fall under the Bureau of Water Resources (DRH) of the Ministry of Natural Resources (SRN). Hunting fees are the responsibility of the Bureau of Renewable Natural Resources (RENARE) also of the SRN.

3.3 Macroeconomic Trade Policy Institutions

Macroeconomic trade policies that have some influence on Honduran natural resources are import tariffs, trade barriers, import and export subsidies, taxes, controls and quotas.

The application and enforcement of tariffs and import quotas falls under the jurisdiction of the Customs Bureau of the Ministry of Finance. Import and export subsidies, however, are under the Ministry of the Economy and Commerce, particularly for those industries that are "classified" as priority industries, a classification and "control" that is carried out by that Ministry's Bureau of Industries. The application of payments, whether import or export-oriented, is done at the Central Bank. Until this year, these import subsidies and export incentives, like the CETRAs (as a general export incentive) and the CEFEX (for non-traditional exports), have been issued by the Central Bank. CEFEX permits also required a prior approval of the Ministry of the Economy and Commerce. CEFEX were originated by the Law of Export Promotion. This law also created the Commission for Export Promotion that evaluated, recommended, and advised on the benefits and products to be included in each case. The members of this Commission included a representative from each of the following: the Ministry of the Economy and Commerce, the Ministry of Finance, the Central Bank, the Ministry of Natural Resources, the National Association of Exporters, the National Association of Industries, and the Federation of Producers and Exporters of Agricultural and Agro-industrial Products (FEPROEXAAH).

COHDEFOR is the public sector institution that controls lumber and other

wood products exports. Although prior to 1983, COHDEFOR had the exclusive right to lumber exports, since that year, private sector exporters can do so directly, in COHDEFOR's name and under COHDEFOR's supervision.

For the conservation of biodiversity, Honduras, along with 80 other countries, joined the Convention on International Trade of Endangered Species (CITES) in 1984. This Convention protects endangered species from commercial and trade activities and establishes as its enforcing agency, the Bureau of Renewable Natural Resources (RENARE) of the Ministry of Natural Resources.

3.4 Regulatory, Sectoral and Tenure Policy Institutions

For policies related to sustainable agriculture problems, there are a number of relevant institutions.

The application of price controls falls under the responsibility of the Bureau of Internal Commerce of the Ministry of the Economy and Commerce. This Bureau is directed by an inter-institutional commission, comprised by representatives from the Central Bank, the Ministry of Natural Resources and the Ministry of the Economy and Commerce. This commission reviews requests for price changes from the private sector, and fixes consumer prices for those agricultural products under control. The Bureau has inspectors that supervise and monitor consumer prices and apply the sanctions that may apply in any particular violation of these norms. Another price control mechanism has been the creation of BANASUPRO stores for consumers.

In addition to these mechanisms, the Bureau of Internal Commerce also created the Farmer's Fairs, with the purpose to reduce the profit margins of intermediaries, in a market where producers and consumers can interact directly.

Created in 1978, the Honduran Institute of Agricultural Marketing (IHMA), administers price controls for basic grains, although its mandate may include any other agricultural product that "the country requires." In order to comply with its mandate, IHMA may, among other things, establish minimum guaranteed producer prices for the purchase of basic grains; buy and sell; import and export; limit or control grain imports and exports; build and operate storage facilities; process and preserve grains, and offer these types of services to producers. The Board of Directors (the Minister of Natural Resources, the Minister of the Economy and Commerce, the Minister of Finance, the Minister of Planning, and the Executive Director of the National Agrarian Institute), and a General Manager are the governing body of IHMA. The mechanism used by IHMA is to buy from the grain producers when prices are low and there is an excess supply, at a higher price; and sell during times of shortage, at a lower price to the consumer. The Callejas government is considering some changes in this policy: elimination of IHMA's monopoly on imports of basic grains and wheat, plus the elimination of the price guarantees, limiting its activities to publishing minimum and maximum prices based on international prices and transportation costs.

The National Bank of Agricultural Development (BANADESA) is another important institution. BANADESA's primary objective is to channel financial resources to the development of production and productivity in agriculture, cattle, poultry, beehive raising, and forestry. The authorized capital of Lps.

75 million is totally constituted by government funds. BANADESA's top decision-making body is its Board of Directors, comprised of the Minister of Natural Resources, the Minister of Finance, the Minister of the Economy and Commerce, the Minister of Planning, the President of the Central Bank, the Director of the National Agrarian Institute, the Executive President of BANADESA, a representative of the producers' associations and a representative of campesino organizations. The Bank has an nationwide infrastructure and personnel.

The public sector's planning and implementing agency of the agrarian reform is the National Agrarian Institute (INA) with a broad mandate over everything having to do with land tenure. Its major decision maker is its Executive Director, who has the equivalent position as a Minister of State, and is also a member of the Council of Ministers, the major decision-making body of the Executive, under the direction of the President of Honduras. Among its responsibilities are the administration of the National Agrarian Cadastre and the Agrarian Registry. As an advisory body to its Executive Director, there is the National Agrarian Council, composed of the Ministry of Natural Resources, three lawyers, an agronomist, two representatives from the Honduran Federation of Agriculturalists and Cattle Ranchers (FENAGH), and two from the campesino associations. This Council receives appeals to the decisions of the Executive Director but, due to the opposing interests in its composition, these kinds of conflicts take years to be resolved.

The Honduran Corporation of Forestry Development (COHDEFOR) was created in 1974. COHDEFOR was given mandates over forest resource tenure, utilization and marketing. The organic law of COHDEFOR states: (1) the control of all forests on public or private lands belongs to the State, through COHDEFOR; and (2) the exclusive right to export lumber and to carry out all domestic wholesale marketing also belongs to COHDEFOR. Explicitly, in addition to these fundamental attributes, COHDEFOR has a mandate to:

1. Be the Forestry Administration of the State.

2. Promote and carry out silvacultural, industrial and market research in order to develop and improve technologies.

3. Systematically protect forests from fire, plagues, disease, "destructive" grazing and soil erosion.

4. Promote the application of technologies for the adequate use of forest lands.

5. Directly, or in collaboration with others, implement activities for the protection of watersheds.

6. Constitute and operate, promote or participate in the capital formation of industrial and commercial forestry companies, that may be necessary to fulfill its objectives.

7. Provide credit or guarantees to the private sector, required to extract wood products.

8. Obtain loans, issue securities, and other attributes that may be necessary to fulfill its objectives.

The governing body includes: (1) its Board of Directors (presided by the President and composed of the Ministers of Natural Resources, Defense, Economy and Commerce, Finance, and Planning; the INA Executive Director, and representatives of campesino forestry organizations and cooperatives; the saw milling industry; and the secondary manufacturing industry); (2) its Executive Committee (all of the above, except the President, and the Ministers of Economics and Commerce, and Defense); and (3) its General Manager. In compliance with its mandate, COHDEFOR has formed several companies: CASISA (Central de Aserrio de Siguatepeque, S.A.), as a re-sawing and dimension center, in Siguatepeque; FIAFSA (Forestal Industrial de Agua Fria S.A.), as a 100,000 m3 sawmill in Yoro; CORFINO (Corporacion Forestal Industrial de Olancho), originally a pulp and paper/saw milling complex, now only a large 400,000 m3 sawmill, in Bonito Oriental, to utilize the Olancho Forest Reserve; SEMSA (Servicios Madereros S.A.), as a packaging and dimension center for export lumber, in the North Coast. Other companies were acquired, totally or partially, by COHDEFOR as a result of repossessions due to credit arrears. All have been turned back to the private sector, with the exception of CORFINO, which is to be sold to private entrepreneurs in the near future. Another major thrust of COHDEFOR has been the lumber exports, which provided (until 1983, when exports returned to the private sector) the majority of its revenues.

Other actors in the forestry sector are the sawmills and the logging contractors. The sawmills constitute 99% of the primary forest industry in Honduras. Logging contractors work very closely associated with the sawmills, with most of their operation and equipment financed by the sawmills.

COHDEFOR also has the legal mandate for watershed management. However, there is a lack of trained personnel (only one professional in watershed management) in addition to budgetary constraints and priorities. Water users such as ENEE and SANAA, however, are being pressured by donor and financing agencies of major infrastructure, to get involved in watershed management and protection. These two institutions also have one professional in watershed management and have formed a watershed management unit in their organizational structure. An inter-institutional Watershed Management Commission was formed (CONAMICH) that includes COHDEFOR, SANAA, ENEE, the Bureau of Water Resources (DRH), the LUPE Project, and SECPLAN, in order to coordinate these activities and set priorities on a national level. This Commission has existed at the lower and middle-level of their agencies but does not involve high-level interaction.

The Ministry of Natural Resources is structured into four operative levels: a) policy and decision maker level which consists of the Minister, the Vice-Minister for Livestock and Agriculture, and the Vice-Minister of Natural Resources; b) a specialized technical assistance level, which is primarily located in the Sector Planning Unit (UPSA); c) an administrative assistance level, which consists of the accounting and finance offices as well as the maintenance and personnel offices; d) the operative levels which are characterized by the central and regional offices charged with the responsibility for applying the laws and regulations of the Ministry.

The Bureau of Water Resources (DRH) of the Ministry of Natural Resources is another water user and regulator. Under its responsibility fall hydrologic and climatological services, subterranean waters, engineering, irrigation and drainage. Its climatological services sometimes conflict and duplicate, without uniformity in data gathering, with the Meteorological Service of the Ministry of Public Works and Transport. (For agricultural purposes, however, the data gathered by DRH is more useful.) The Callejas government is considering a reorganization of these activities. The implementation of the 1927 Water Law and the proposed water law fall under the jurisdiction of the DRH. This is also true for the proposed Water Master Plan, where SECPLAN and DRH are both involved in its development.

The Plant and Cattle Protection Programs are located in the Ministry of Natural Resources. All pesticides and herbicides must be registered for use in Honduras with these programs. The programs are supported by a Quality Control Laboratory in Tegucigalpa. The laboratory is charged with the application of the pesticide control regulations. It offers several free or very low cost services to the public and private sectors. However, the laboratory has not been fully equipped to be able to comply with its mandate.

Due to the Ministry's inability to conduct quality control of pesticide products, those elements of the private sector that wish this information on agricultural chemicals have opted to pay for the analytical service offered by the Honduran Foundation for Agricultural Research (FHIA). This service has proved important to the farmers who are producing crops or cattle for export to the United States, where their products must undergo inspection for pesticide residues. The reforms to the Plant Health Law establish the intervention of the Center for the Study of Contamination Control (CESCCO) from the Ministry of Public Health to analyze pesticide residues on food products in support of the labor of the Division of Food Control within the same ministry. The Ministry of Natural Resources is in the process of securing a donation from the Government of Japan for the establishment of a quality control laboratory. In addition, the Livestock Program has prepared and presented a loan proposal to USAID for better equipping the laboratory in San Jose that presently conducts the biological analyses. The Honduran Association of Distributors and Salesmen of Agricultural Products (AHDIVEPA) was constituted in 1978, but has not been active enough to develop its potential for promoting the responsible management of pesticides.

Another major factor affecting the environment is the problems associated with waste management. The official waste management policy of the government of Honduras, which is executed through the Ministry of Health, is contained in the Sanitation Code and Regulation, and in the Law that creates the National Water and Sewer Service (SANAA). The Ministry of Natural Resources also outlines certain waste management policies in: its Mining Code; the regulation that controls the management of pesticides and the General Regulations of the Hydrocarbons Law. The Police Law establishes a policy for garbage and litter control and the Penal Code establishes penalties for the irresponsible disposition of wastes.

The Ministry of Health is the most important institution involved in waste management as it is charged with elaborating the national health policy. However, all other government institutions have an important role in determining

the effectiveness of any broad waste management policy adopted for the nation. Among the most important of these institutions are SANAA, the Ministry of Natural Resources, the Ministry of Government and Justice, the Ministry of Defense and Security, the Ministry of Education and the Ministry of Economics.

Within the Ministry of Health is the Bureau of Public Health, which has several Divisions under its administration. For waste management purposes, there are four important Divisions: the Division of Basic Sanitation, the Center for the Study and Control of Contaminants (CESCCO), the Division of Food Control and the Division of Vector Control.

The Division of Basic Sanitation operates with three major goals: to assist in diminishing morbidity and mortality in the population from diseases that originate from the inadequate disposition of wastes; to promote the development of good hygiene among the rural and low income urban populations through programs in health education; to develop the physical infrastructure to expand the access to drinking water and to provide for adequate means of sanitation (latrines, septic tanks, wells, sewers, etc.) through community participation. This division works with funds from the governments of the United States, Japan, Switzerland, Germany and the European Economic Community as well as the Government of Honduras.

CESCCO also has a mandate in waste management. It was created from an international agreement between the Government of Honduras through the Ministry of Public Health, the Government of Switzerland through the Swiss Development Cooperation and the Panamerican Health Organization who have each contributed to the project financially. These three signatories are the members of the CESCCO Administrative Council who have outlined the work that CESCCO should undertake.

The Mining Code and the Regulations of the Law of Hydrocarbons are applied by the Ministry of Natural Resources through the Bureau of Mines and Hydrocarbons which is charged with controlling the exploration and exploitation of mineral and petroleum resources through concessions and contracts to public and private lands.

The Ministry of Government and Justice, through each of its 289 Municipal Governments in Honduras is responsible for upholding the Sanitation Code and its regulations as well as the Police Law and the Penal Code. The Municipal Governments must select sites for garbage disposal when they take on the job of sanitation in their communities. According to the Sanitation Code the municipalities must receive authorization from the Bureau of Public Health to use disposal sites selected.

The Ministry of Culture and Tourism (SECTUR) has the mandate to grant coastal land concessions, 3 Km. inland from the highest mean tide. The granting procedure involves four other institutions: the Ministry of Natural Resources Bureau of Renewable Resources (RENARE) and COHDEFOR for a technical judgement on the concession area; the National Agrarian Institute (INA) which has the mandate to issue judgement on all state lands; and the Attorney General's Office, which, if all judgments are favorable, draws a twenty-year, renewable leasing contract that charges Lps.4/ha/year and establishes the boundaries of the concession.

The Ministry of Natural Resources through the Bureau of Renewable Natural Resources (RENARE) is responsible for executing the Fisheries Law as well as the Law for the Exploitation of Marine Natural Resources. The Fisheries Law is a particular responsibility of the Department of Hunting and Fisheries within RENARE. In 1980, this Department developed a manual for the application of the law, which was distributed among all the department inspectors, who also have received some periodic instruction. The manual instructs the inspectors on what their conduct and functions should be, the significance of certain legal terms, the importance of certain legal proceedings such as how to prepare inspection and penal reports as well as other jobs that include the sampling of contaminated water and dead or diseased fish for laboratory analysis, staying alert to industrial activities that could compromise water quality, maintain a register of all fishermen, and maintain capture statistics, etc. In 1988, a total of 84 inspectors were employed by the department.

According to the Fisheries Law, the Ministries of Economy and Public Finance should contribute to the execution of this law through the participation of the Merchant Marine. The Ministry of Health is charged with controlling hygiene in the fishery industry. The Defense Ministry must also contribute to the effective application of the Fisheries Law in coordination with the Ministry of Natural Resources.

The Law for the Exploitation of Marine Natural Resources is the principal responsibility of the Ministry of Natural Resources but rather than depositing this responsibility in any one General Department, it creates a multi-institutional Commission to develop the regulations of this law and supervise its execution. As indicated in the law, the other Ministries involved are Economy, Public Finance, Public Health, Defense and Foreign Relations as well as the National Port Authority.

In wildland management and biodiversity, the most important public sector institution is the Bureau of Renewable Natural Resources (RENARE). Created in 1974, RENARE's objective is to formulate and implement policy on the utilization of water and biological resources. It is comprised of a Wildlife and Environmental Resources Department that manages protected areas and fauna; a Fisheries Department that promotes and implements policy on the use, management and utilization of natural and cultivated aquatic resources; an Inspection Unit that supervises the compliance of the Bureau's policy; and a Unit of Promotion that promotes environmental education. The management of wildlands is confusing in some aspects because there is no clear state administrative structure: there are 41 areas "managed" by RENARE, 5 by COHDEFOR and 5 by other agencies, such as the National University, the Panamerican Agricultural School, and the Honduran Institute of Anthropology and History. See Exhibit 3.1 for a summary of the institutions involved in the management of wildlands.

The Honduran Ecological Association (AHE) is the most prominent of the wildlands and biodiversity non-governmental organizations. AHE was created in 1976 and has been involved in the coordination and promotion of some conservation initiatives in the creation of 37 new protected areas and in the management of two, including the Rio Platano Biosphere Reserve. In addition, AHE has been a leader in environmental awareness campaigns promoting these protected areas.

3.5 Development/Environmental Program Institutions

Development Programs

Development/environmental policy planning at the national level for the public sector, is governed by the Planning Law which created the Ministry of Planning, Coordination and Budget (SECPLAN). SECPLAN is the technical and operative organ of the government for planning purposes. Before becoming a Ministry, this institution was known as the National Superior Council of Economic Planning (CONSUPLANE) whose functions had been outlined in a Congressional Decree of 1975.

Elements of SECPLAN involved in the planning process important for natural resource management are the three general Departments with the following divisions:

Territorial Planning	Planning & Programs	Census & Statistics
Regional Planning	Global Planning	Population, Housing Census
Human Settlements	Programming, Budget	Surveys
Regional Coordination	Agriculture Sector	Information
Regional Projects	Industry Sector	Statistics
Environment	Infrastructure Sector	Human Resources
	Social Sector	Administration

SECPLAN has highly trained technical personnel, well qualified to carry out diagnostic studies or evaluations of the different sectors involved in the development of Honduras.

While many public sector institutions have regional offices, their administrative boundaries do not coincide. Therefore, planning and administration do not coincide. The government proposes to unify all administrative boundaries and, to comply with the Planning Law, it will also constitute the Departmental Planning Councils, composed of representatives of all public sector institutions, the department's congressmen, the armed forces, private sector, worker's unions and campesino organization representatives. These planning councils are chaired by the department's Governor. Each planning council will have a technical planning unit and these will also be constituted at the municipal level, with the mandate to formulate the objectives, goals and policies, strategies and projects at the local level.

The proposed Municipal Law will enable the local governments to develop their autonomy by establishing control over public services and fiscal affairs. They will be charged with managing their own budget according to income from taxes collected and other local fees. This will encourage a reevaluation of property taxes and service fees. It will require more austere control over human resources, as municipal employees' salaries will have to be adjusted according to new responsibilities and relative productivity.

The Road Master Plan (PMV) for Honduras was prepared by the Bureau of Sectorial Planning of the Ministry of Communications, Public Works and Transportation (SECOPT). The PMV consists of a series of extensive studies on factors relating to roadway development planning, construction and maintenance, with emphasis on planning in order to contribute to the orderly economic growth of Honduras. The PMV provides the SECOPT authorities with the guidelines necessary to make decisions about where and how to build, improve and maintain roads in the near and distant future.

SECOPT is organized into nine Bureaus and its major functions are the following:

a. Preparation of territorial maps;

b. Study, construction, maintenance and administration of public works;

c. Design, supervision and construction of the roadway system as well as its maintenance and modification;

d. Administration and regulation of the State institutions which manage the public mail, telegraph, cable, telephone and radiotelephone services.

Changes in policy are often introduced by donor/development and/or finance agencies, such as the IDB and CABEI. The largest development funding agencies in Honduras are USAID and IDB. Examples of the policy changes that funding agencies encourage are abundant. For example, many of the changes in COHDEFOR have been stimulated by forestry projects - stumpage appraisal and the sale of timber on the stump, the privatization of COHDEFOR's companies, and the return of lumber exports to the private sector. The involvement of COHDEFOR and the National Electric Company (ENEE) in watershed management has also been stimulated due to the interest generated in this activity in IDB and IDB-financed projects like the El Cajon hydroelectric project. The decisions taken by any government or government agency are sovereign; however, all donor or financed projects require agreements and/or contracts, and the introduction of changes in policy take the form of contractual or disbursement conditions.

Environmental Education

In general, many contributing factors that affect natural resources are associated with environmental education. An official policy of environmental education has not yet been incorporated into Honduras' legal instruments but policy makers within the sector have been and are working with the concept.

Among the personnel of the five Bureaus of the Ministry of Education (Primary Education; Secondary Education; Technical Education; Adult Education; Educational Planning and Reform) at least one professional per office has received some significant training in environmental education. Therefore, capability to execute policies that promote and advance environmental education as a science and practice in the Honduran school system does exist.

Other active institutions in environmental education policy include the Committee for the Enhancement of the Environment (COCMA), Companeros of the Americas, Honduran Teachers for the Conservation of the Environment (PACHO), COHDEFOR, the Peace Corps, RENARE, UNAH, UPN and SECPLAN.

3.6 Conclusions

This description of policy and program institutions should provide the reader with an understanding to the various roles that many of the institutions play in the development process and related resource use decisions. Many of these institutions have limited financial and/or human resource capacity to fill their roles. Many of those roles would be difficult to fill in the best of situations. Nevertheless, it is this framework from which decisions in Honduras are currently made. An effort has been taken in this chapter to clearly describe the responsibilities and policy objectives of these institutions. The assessment of their effectiveness is incorporated into the analysis in Chapter 4.

Exhibit 3.1

INSTITUTIONS INVOLVED IN THE MANAGEMENT OF WILDLANDS

Institution	Management Category	Number	Area (Has.)
RENARE	National park	12	240,371
	Wildlife refuge	8	52,800
	Biological reserve	18	more than 71,000
	Biosphere reserve	1	525,000
	Natural monument	1	N/A
	Multiple use area	1	34,628
COHDEFOR	Forestry reserve	4	1,642,011
	Botanical garden/Bio.res.	1	540
SANAA	Water producing area	1	3,280
IHAH	Cultural monument	2	N/A
Fundacion Cuero y Salado/UNAH	Wildlife refuge	1	8,500
EAP	Biological reserve	1	234
TOTAL			2,578,364

Source: Draft "Perfil Ambiental" 1989.

4.0 ASSESSMENT OF POLICIES AFFECTING NATURAL RESOURCE AND ENVIRONMENTAL PROBLEMS

4.1 Introduction

Natural systems have physical characteristics that affect the kinds of institutions likely to be useful in coping with or changing undesired outcomes. Socioeconomic characteristics such as the degree to which potential users can be excluded also affect resource use. Institutions, in turn, affect human production, consumption and land use behavior. The outcomes or consequences of policy choices affected by institutions and behavior include residuals, resource use now and in the future, the quality of life, and other concerns. From this core knowledge the analysis identifies behavioral results that suggest how policy alternatives affect various outcomes.

A policy inventory requires a general and more cursory review of current conditions. Nevertheless such a review will require some analytic content in order to establish priorities and reach prescriptions about further research.

The analysis presented in this chapter will include a description of a wide range of policies identified as having importance for resource use decisions in Honduras. The discussion will include aspects of broad institutional issues, more specific property rights associated with specific problem areas and the rules-of-the-game as they influence specific problems. Many policy issues have impacts on a wide range of resource issues while others are more specific to a given problem area. Exhibit 4.1 presents a summary of the policies examined in this inventory. There are the four problem areas as described in Chapter I: sustainable agriculture, production from natural forests, management of critical watersheds and protection of wildlife and biodiversity. These problem areas are examined and discussed by policy categories which include macroeconomic monetary, fiscal and trade policies; tenurial issues; regulatory and trade issues, and; development and environmental programs. The policies which appear in more than one segment of the exbihit are addressed in one place in the text below with the discussion of their effects on the various problem areas unified to avoid repetition. Other policies may also have multiple problem area effects but are listed in one segment because that policy seemed most pertinent to that problem area. However, the analysis of each policy does relate its effects to the entire range of resource and environmental issues.

4.2 Monetary Policies

Exchange rate, money supply and interest rate issues may appear to be removed and irrelevant to the decisions taken by the users of natural resources. However, these and other macroeconomic policies discussed below have had commanding importance in resource issues. The connections are nevertheless not well understood and seldom considered by governments and international organizations concerned with the macroeconomic policies of developing countries. Given the wide scope and effect of these policies they often have contradictory effects on different aspects of resource use. This discussion will sketch the principal features of the macroeconomic policies which have prevailed in Honduras as well as the changes taking place with the new government. Connections to

Exhibit 4.1

Summary Policy Inventory Framework

POLICIES	SUSTAINABLE AGRICULTURE	PRODUCTION FROM NATURAL FORESTS	WATERSHED	WILDLANDS BIODIVERSITY
MACRO/ MONETARY	Exchange rate Interest rate Money supply	Exchange rate Interest rate Money supply	Exchange rate Interest rate Money supply	Exchange rate Interest rate Money supply
MACRO/ FISCAL	Land tax Income tax Public expenditure Deficit External Debt	Land tax Income tax Public expenditure Deficit External debt Stumpage fee	Land tax Public expenditure Deficit Water use fee External debt Water surcharge	Land tax Public expenditure Deficit Conservation stamp External debt (debt for nature) Hunting fee/license
MACRO/ TRADE	Export taxes Import tariff and barriers Pricing policies Export promotion	Export taxes Import tariff and barriers Export controls Pulp, paper import subsidies	Import tariff and barriers Export promotion Export taxes	Export quotas Export control-endangered species Quality control Non-traditional export promotion

POLICIES	SUSTAINABLE AGRICULTURE	PRODUCTION FROM NATURAL FORESTS	WATERSHED	WILDLANDS BIODIVERSITY
SECTORAL/ REGULATORY	Land tenure framework INA policies Land bank Price control policies-consumer Basic grain law BANADESA's structure and management policies IHMA - structure and functioning	Land tenure framework Tenurial issues in forestry (including tree ownership, AMI, and tributary areas) Forestry regulations Role of COHDEFOR in production and marketing Fuelwood policies	Land tenure framework Water law Fisheries law Mangrove Commission Procedures for coastal land concessions Pollution and waste management Plant protection law	Land tenure framework CITES International Conventions Decree 86-87 Accord 001-90 Decree 976, 977-80 Decree 57 (Lake Yojoa) Fisheries law
DEVELOPMENT/ ENVIRONMENTAL	Industrial development law Development agency programs Irrigation, roads, infrastructure	Development agency programs Private sector programs Agro-forestry Reforestation and forest production	Water master plan Planning laws Municipal lawve Master road plan Irrigation development Energy development Municipal dev. policies Environmental conflict prevention and mitigation Environmental education Shrimp development Decentralization	Promotion of tourism Parks, recreation Development agency & NGO Environmental education

resource and economic issues will be drawn or suggested as is appropriate.

The exchange rate regime in Honduras had been represented by an overvalued currency until the beginning of this policy inventory in March, 1990. As such, and for some prior years this regime had implicitly subsidized and hence encouraged imports and implicitly taxed and reduced exports. Several adjustments to the system had effectively created a dual exchange rate to deal with the limited amounts of foreign exchange available. The present floating system may well become a moving peg after experience is gained.

The primary effect of the overvalued currency has been to skew relative prices against agriculture in comparison to other sectors of the Honduran economy. This has resulted in reduced investments and savings in the agricultural sector. In forestry the implicit tax may have at the margin reduced exploitation of the forest resource. The recent floating of the exchange rate will have the result of increasing prices received by farmers as well as increasing consumer prices. It should increase exports and decrease imports. It should also shift production in favor of export crops. Pesticide imports should decline and their use become more rational with respect to their actual cost. On the other hand there could be increased pressures on the export of timber without compensating policies. Therefore, the increased generation of foreign exchange may come in part from increased depletion of the forest resource base and improved agricultural sector performance based on incentives to better manage lands. It should also be noted here, though it will be discussed below, that better returns to agriculture can continue extensive farming practices and expansion of the agricultural frontier since problems still remain with respect to land tenure and forest protection.

Money supply issues in Honduras are determined by external trade and domestic and external debt policy. Recent performance has been mixed. A tight monetary policy was applied from 1984 to 1986: there was an 8% annual growth rate of the money supply in that period. This policy contributed to keeping the inflation rate relatively low at approximately 4.5% during 1984-1986. In 1987, the policy was modified, mainly due to pressures from the growing fiscal deficit, so that the money supply was expanded at a 19% rate in that year, slowing later to 14%. This increase had a significant impact on prices, as inflation accelerated to 9.8% in 1989 and estimated 15% in 1990.

The purpose of a money supply policy is to maintain a balance between the global supply and demand, in order to avoid inflation or stagnation. Money supply has an effect on the inflation rate, which determines the real interest rate. A high real interest rate discourages long-term investments required for economic growth, as well as those required for maintaining and improving the resource base and the productive capacity.

Monetary policy is essential for the performance of the economy. A contractionary policy decreases investment and the operational level of the economy, tending to lead to economic stagnation, high unemployment levels and worsening poverty. On the other hand, an expansionary policy affects price levels and, if it is not carefully managed, may result in unacceptably high rates of inflation. An inflationary environment increases the risks and the real interest rate, discouraging investments, especially long-term investment needed

for proper conservation and improvement of the resource base.

While the monetary supply situation in Honduras has not been extreme, the economy has been relatively stagnant as represented by the decrease in consumption relative to the increase in population. There has also been an increasing rate of unemployment and underemployment in both rural and urban areas. These features of the economy place pressure on resources as people use open access resources to supplement inadequate incomes.

Interest rate and credit policy has been highly controlled by government regulations. There are official maximum lending and deposit rates. Other characteristics include lines of internal and external financing, agricultural credit at subsidized rates to generally wealthier farmers and favorable reserve requirements for agricultural and livestock portfolios.

As of April, 1990, there is an inflationary process underway that will tend to turn the real interest rates negative. The real interest rates in 1989 were 1.5% and 3.5% for loans for basic grain production and other crops, respectively. However, due to increased inflation, in 1990 those real rates are estimated to be about -2% and -4%, respectively.

The development of any economic activity depends on the availability of financial resources for its execution and their cost, represented by interest rates. In this way the use of credit influences the use and management of the natural resources by promoting and facilitating the development of new activities and the adoption of new technologies that can have positive or negative impacts on the natural resource base.

The National Agricultural Development Bank (BANADESA) is the state bank that handles agricultural credit, dealing mainly with the agrarian reform cooperatives and small and medium sized private farmers. This institution has a limited capacity to serve the agricultural sector due to the high arrears of its portfolio, high operating costs and lack of autonomy in its operations, since it is expected to finance other semi-public institutions.

The private banks are conservative and have a limited participation in financing agriculture due to the high risk involved in those operations and to the lack of confidence in the law that regulates rural collateral. Their clients are the commercial farmers and ranchers, and their participation has increased through use of the special rediscount funds of the Central Bank.

The interest rate policy has tried to promote the development of the economy, especially the agricultural sector. However, it has been constrained by the lack of long-term credit for investment in developing permanent crops and improving the farm through activities like soil conservation. The large bulk of agricultural credit has financed short-term inputs which, while essential for production, in some cases have deleterious environmental effects (fertilizers, pesticides). The subsidized credit for these inputs have led to their inefficient use. The lack of access to credit lines by the small producers has had an impact primarily in basic grains production (maize), which has had a yearly growth rate of 1.7% which is less than the population growth rate during 1970-1988, making the country increasingly dependent on grain imports. The

reactivation of the sector requires timely credit that would allow the small producers to improve their productivity through the adaptation of appropriate technology.

Another factor that limits the positive effect of credit has been the policy of subsidized interest rates for specific products which, in addition to the lack of supervision, frequently results in deviation of that credit to non-authorized uses.

The creation of a fund for the small coffee producer has had a positive effect on sustainable agriculture, by facilitating the necessary resources for the improvement and diversification of the coffee crop, as well as the promotion of technologies oriented to soil conservation and hillside crops. However, there have been incidents of intrusion of coffee activities into protected areas.

The subsidized credit for livestock has promoted extensive ranching, which occupies approximately 50 percent of the agricultural land, with the resulting inefficient use of this scarce resource and its degradation.

The subsidized credit for other crops is mainly used for export crops that use high proportions of fertilizers to increase their productivity. This can decrease the natural capacity of the soil to regenerate, thus requiring higher amounts of this input to maintain the level of productivity. Short-cycle export crops, such as melons and pineapples, require high levels of pesticides, even though the type and quantity used are often controlled so that the toxic residues in the fruit are within the limits allowed for imports into the U.S. This is not the case with pesticide concentration in the soil, where it can be cumulative. Pesticides also filter into the groundwater where its presence can lead to irreversible or very long term contamination.

4.3 Fiscal Policies

Fiscal policies as herein defined include not only government receipts and expenditures and debts but also efforts directed at increasing revenue through taxes or user fees. A number of such tools are discussed. These include stumpage fees, water user fees and hunting fees, among others.

Fiscal Deficit

Fiscal deficits have become important elements in determining the effectiveness of the government in meeting its resource management objectives. High current public sector expenditures have been difficult to reduce. All efforts undertaken to date to reduce them have resulted only in slowing down their excessive growth (29.4% in 1980). Public expenditure annual growth rates in the 1980s fluctuated between 7.6% and 17%, with the exception of 1986 when the growth rate was 3.3%. In addition, current revenues have had a growth rate slightly lower than the public expenditure growth rate.

This has meant a persistent increase of the fiscal deficit, going from 10% of the GDP in 1979 to 25% during the last half of the 1980s. These deficits reach 21% and 32% when the amortization of the internal loans is added.

The deficit was financed from external funds up to 1985, when it amounted to 66%. This relation was reversed in 1988, when 68% of the deficit was financed from domestic sources.

The basic problem in the fiscal deficit is that it cannot be financed with domestic credit without increasing inflation. The proportion of domestic resources used to finance the deficit went from 2.6% in 1980 to 4% in 1987 and 1988. This financing has to be made with resources from the commercial banking system or with resources from the Central Bank, thus increasing the money supply and the pressure on prices.

Another effect of the fiscal deficit comes from its financial sources, since financing it with internal resources decreases the availability of resources for the private sector, thus slowing its activity. The resulting decrease in investments for long-term improvements such as irrigation, drainage and soil conservation affects the production capacity.

The fiscal deficit reduces the activity of the private sector and/or increases inflation, unemployment and poverty and, consequently, the pressure on the hillsides and forests. The population with the lowest income is forced to seek alternatives for their subsistence, turning to the forests for farm land to grow their food and for fuelwood that will bring them some income to satisfy their basic needs.

External Debt

The economic growth of the 1970s was largely due to the rise in public investment, which during that period recorded annual growth rates of up to 20%. The first large increase in public investment occurred because of the rebuilding activity aimed at repairing the damages caused by hurricane Fifi in 1974, and afterwards, because of the start of major projects such as El Cajon and the pulp and paper project (CORFINO), as well as the development of basic infrastructure. The expansion of public investment was financed mainly with external loans granted by international financing entities. This circumstance accelerated the growth of external debt which was 62 percent of GDP in 1988.

The interest on the external debt has been a determining factor in the balance of payments deficit, since it absorbs 30% of the export earnings.

As a source of financing for investments, the external debt is a key factor determining the behavior of the economy, especially in countries like Honduras, with little domestic savings capacity.
Both the public and private sectors, and all branches of the economy, are involved in foreign borrowing.

The external debt may have positive or negative effects on the economy, depending on the way it is used and the amount involved. If it is used in an efficient and adequate manner, it can generate beneficial effects for the whole population. On the other hand, inappropriate use of the external debt can lead to serious problems, bringing the economy almost to a full stop by limiting the net availability of foreign exchange for imports. This is especially true when the industrial sector depends heavily on imported inputs, as is the case in

Honduras, where 75% of all imports are raw materials, machinery and fuel. A decrease in the net availability of foreign exchange thus means a direct loss of production.

The high level of external debt and the amount of the interest on the debt, reduces the possibility of acquiring more funds to be used in development programs. The government's investment capacity is thus limited by the need to earmark 6.5% of the GDP to pay the interest on the external debt.

The payment of this interest has been one of the determining factors in the foreign exchange shortage in recent years and, consequently, of the overvaluation of the lempira.

An external debt burden reduces the Government's possibilities for investment, forcing it to cutback its programs for the promotion of soil conservation, especially if they are linked to the granting of loans or subsidies. It also reduces agricultural growth generally because of the lack of investment in marketing and production infrastructure. The costs are thus increased, promoting the over exploitation of the soil in order to obtain maximum yields. The decrease in investment also results in an increase in unemployment, rural and urban poverty and in increased pressure on the forests. When the government's expenditures are limited, the portion of those expenditures destined for forestry control and monitoring is reduced, resulting in more depletion of the forest resource through inefficient use. Some problems may also develop when resource using industries are unable to import technology which would increase the efficiency of their operations.

Debt-for-equity swaps can be used to reduce external debt and also provide priority projects for the country. There has been relatively little activity in this area in Honduras. The principal transaction has been the purchase of the Mochito mine by a U.S. firm. Debt-for-nature swaps have become a stated goal of President Callejas. Such transactions would provide support to natural resource protection activities while reducing debt related pressures.

Public Expenditure

The main component of public expenditures (defined as current expenditures plus capital expenses, without including the internal debt amortization) are current expenditures. In 1980 they represented 59% of the total expenditures, a percentage that increased to 82% in 1987 because of a large increase in salaries and wages. Capital expenditures have gradually lost significance in the total public expenditures, decreasing from 42% in 1980 to 18% in 1987. At the same time, due to the high investment rate in the 1970s and in 1982-1983, the annual amortization of the internal debt has increased from Lps. 185 million in 1983 to Lps. 743 million in 1988.

The reduction in public capital expenditures came as a response to the economic conditions of the country, which made it necessary to confront serious problems in the balance of payments and a large fiscal deficit. The decision to reduce the capital expenditures was forced by the rigidity of current account expenditures, which in turn arose from pressure from unions and the perceived need for the Government to create more employment for political reasons. In this

kind of situation, the least controversial expenditure is cut, although that action damages the productive capacity of the country.

The allocation of public expenditures is relevant to the overall functioning of a country's economy, since the construction and maintenance of infrastructure (roads, electricity networks, ports, etc.) depend on those allocations to give adequate support to the productive activities.

Public expenditure policy is fundamental for the performance of the economy. It is one of the tools to reactivate the economy in periods of stagnation or recession. Likewise, an excess of public expenditures can lead to a decrease in the private sector activity and inflationary problems for the economy.

Lack of funds affects many resource management activities. For example, there is no adequate water quality monitoring for lakes and rivers, nor control of water-based activities. In Lake Yojoa only sport fishing is permitted. However, due to lack of monitoring and control, commercial fishermen utilize nets and harpoons on the lake. In the rivers, especially in the Patuca area, fishing with dynamite is practiced. The lack of monitoring in the Mosquitia area has also led to indiscriminate hunting of deer and other wild animals for their pelts.

Fees and Taxes

Stumpage fees are set, issued, promulgated, directed, monitored and enforced by the Honduran Corporation of Forestry Development.
Traditionally, stumpage valuation in Honduras has been based on a fixed rate. Prior to the creation of COHDEFOR (1974), stumpage values were set at a flat rate of Lps.3.00/m3. Nevertheless, in reality, sawmills would offer a flat amount for entire stands without taking into account volume, species, quality or anything else. A study done in the Lepaguare (Department of Francisco Morazán) Municipal forest, in 1964, revealed that the equivalent stumpage paid by the local sawmill for its pine supply was less than 1/10 of one "centavo" per cubic meter.

In 1974, Forest Law 103 was enacted which created COHDEFOR and declared all standing timber "of public interest and domain," and again, on a flat-rate basis, the stumpage fee was set at Lps.6.00/m3 for pine timber. Hardwood stumpage fees started at Lps.12.00/m3. In 1981, stumpage fees were doubled, again at a flat rate, of Lps.12.00/m3 of pine timber. Hardwood timber stumpage fees were also increased equivalently. These flat rates were not stumpage fees, per se, since they were not charged for standing timber, but rather, they were charged per cubic meter of extracted logs, measured on the transport trucks (sometimes) or accepting truck driver estimates. No less than 50% of the volume remained in the logging site and was never charged stumpage.

The same flat rates are being applied in the pine forest albeit in some cases on the standing timber. Hardwood rates are also flat rates although some species pay more than others, ranging from Lps.18.00/m3 to Lps.30.00/m3. However, they are still being applied on the basis of extracted volume, where the waste in the forest and in the mills, is even greater than in the pine forest.

The water user fee is a direct tax on the use of a public resource. It is a common element of water laws, a new law proposed before the National Congress, and the existing 1927 Water Law. In practice, it is very difficult to implement this measure due to the existing difficulties in granting water concessions and in the control and administration of the resulting revenue nation-wide. Presently, only 2% of the agricultural uses of water is registered. The vast majority of users are not paying and only the large agricultural companies, such as the banana corporations are paying the annual fee of about Lps.50,000. If this fee were administered correctly, under the present rate structure of Lps.0.001/m3, the government revenues could be more than Lps.1 million. At the present time, revenues are less than 5% of this. Surcharges on water services are used to fund the maintenance costs of the irrigation districts. They are equivalent to Lps.0.0025/m3 of water for irrigation. Present expenses on maintenance for these districts exceed revenues by more than double their amount, resulting in a chronic lack of maintenance funds. If there were an institutional capacity to implement these surcharges, the revenues could exceed Lps.4 million/year, compared to the Lps.60-70,000 of present receipts.

Water distributive fees presently do not exist. Their purpose is to internalize costs for watershed management and wildlands conservation through funds generated from 2-4% of user revenues from potable water and hydroelectric companies, SANAA and ENEE. These funds would then be applied for purposes of watershed protection by RENARE and COHDEFOR. The proposed planning, monitoring and evaluation agency is SECPLAN, while the Central Bank would be the depository and administrator of these revenues. The effectiveness of these institutions in watershed and wildlands management is, to this date, unproven. Much institutional reinforcement would be required in both cases.

The Law No.85-84 established the hunting sport license fee of Lps.100/year. This was done in the belief that the hunting sport in Honduras was abundant and organized. The primary purpose of this law was to generate revenues for the government and not wildlife management and conservation. Since there is no hunting law that requires a hunting license, this fee, whose implementation is in the hands of RENARE and whose collection is in the hands of the Central Bank as the issuer of the tax stamp, is ineffective. On the other hand, a Lps.3-5 conservation tax stamp is being proposed that would tax those nationals and foreigners leaving the country, to fund the management of wildlands.

4.4 Trade Policies

Trade policies include the general policies which establish import tariffs and export taxes but also specific issues associated with resources including wood products imports and export quotas on wildlife.

Import Tariffs and Trade Barriers

The tariff structure used in Honduras has varied over time. Until the beginning of the Callejas administration the import tariff policy had been highly protectionist for the industrial sector; J. Berlinsky measured the average protection rate for industrial goods at 99% in 1986. At the same time, effective protection generally has been negative for agricultural goods.

The tariffs have been highest for industrial goods, with lower rates, from 25% to 50% for raw materials for the domestic industry and agriculture. The tariff applied to sugar has been 30%, and basic grains were exempt, placing agricultural products in an unprotected situation versus the local industrial sector. This disparity in protection between sectors was reinforced because the importation of most industrial goods was conducted through the non-official exchange rate (parallel market), while the agricultural goods were imported at the official exchange rate of 2 lempiras for US$1.00.

A new law regulating the economy, promulgated in March 1990, has abolished the system described above. This new law strives to make more uniform all the tariffs within the next three years. This law also eliminates all the exemptions.

As has been the case in other Latin American countries, the previous tariff policy in Honduras had the purpose of encouraging the development of the local industrial sector through import substitution. In practice the privileges and over-protection have brought lack of competitiveness, poor quality of products, and higher costs. This, in addition to the waste of raw materials and inadequate waste management has made the Honduran industrial sector one of the least competitive in international markets. In order to obtain foreign exchange, some of those products that can be exported are subsidized (e.g. sugar), and others have received fiscal incentives that almost offset the exchange rate distortions.

The tariff policy has had an anti-agriculture and anti-export bias, diverting the resources to less competitive activities, with a resulting loss of economic efficiency and lower living standards. The rural population has been directly affected by the low prices of agricultural products and the resulting lack of production incentives. Migration from rural areas to urban areas is increasing, creating more unemployment, and thus increasing overall poverty. The subsidized wheat imports (via tariff exemptions and the previously overvalued exchange rate) have adversely affected basic grains production, especially corn, increasing the dependency on food imports.

When applying very low import tariffs to agricultural products, the real prices on domestic crops are lowered, discouraging national production, while demanding an increase in yields in order to be competitive in the international market.

There are several regulations controlling imports, including those requiring import permits and those prohibiting the import of certain products. The quantitative restrictions are implemented through import permits for industrial goods. IHMA has a legal monopoly over the import of basic grains, which are exempt from tariffs except for a nominal 1% charge.

The import tariffs, while discouraging the production of staples and increasing rural unemployment, also increase the pressure on the forest, where the campesinos cut fuelwood to increase their income and cut trees to clear more land, as the decreasing terms of trade have reduced the profitability per hectare of the land already cultivated. The environment also suffers the effect of an inefficient industrial sector which effectively has no environmental controls, since the industries do not take into consideration the damage that the toxic residues cause to the atmosphere, soil and water.

Paper, Pulp and Cardboard Import Subsidies

An example of tariff exemption effects on resource use can be seen with pulp, paper and cardboard imports. From the 1960s until 1988 Honduras subscribed to the Central American Import Tariff Agreement. This agreement established that certain types of paper and cardboard imports, such as bulk newsprint paper and medium corrugated cardboard, were not subject to any tariff. Paper and cardboard impor in Honduras have averaged around $35 million annually for the past five years, of which, no less than 50% have been exempt from tariffs.

Pulp and paper manufacture is a potential industry for Honduras. The sawmill and plywood industries generally do not utilize at least 45% of the standing volume of an individual tree. They use an even smaller proportion of the timber stand volume. In addition, the maximum yield that sawmills and plymills obtain from logs is 50-60% and roughly 30-35% of the now wasted volume is pulpable material. The presence of a pulp and paper, or any fiber consuming industry, will not only increase the efficiency of the volume yield per log, but also of the volume yield/ha of standing timber, thereby increasing the value of the forest resource.

However, it should be mentioned that this industry has possible environmental pollution problems which would require improved application of environmental regulations.

Export Promotion

This policy has until recently been oriented to non-traditional exports and its instruments were the Export Promotion Certificates, known as CEFEX. These documents were transferable through endorsement and were used to pay the import, export, production, consumption and sales taxes. Their value was in local currency and was tax-exempted. They were granted to exporters of non-traditional products and their value was calculated as a percentage of the FOB value of those exports; a 10% CEFEX was assigned to those products with 20%-50% of national content in their value added, and a 15% CEFEX for those with more than 50% of national value added.

Another scheme to promote exports is that of the "temporary import regime" (RIT) that has existed since 1973 (and was later restructured in 1984). This system allows for the tax-exempt import of raw materials, semi-finished, inputs, machinery, parts, etc., destined for the production for export products.

An additional effort to promote exports took the form of a system of "one-step" export procedures (CENTREX). This system was conceived to speed up the export procedures, but to date it has not worked as efficiently as expected. Financial incentives are given to non-traditional exports through the allocation of funds for the rediscount of loans that have been granted for the production, pre-exportation and export stages.

The new law of economic adjustments of March 1990 revoked all exemptions and subsidies, eliminating the CEFEX, but not the temporary import regime system (RIT). The CEFEX was a fiscal incentive that also aggravated the persistent fiscal deficit.

In all cases, the objective of the previous set of incentives was to ease the foreign exchange shortage and to compensate in part for the anti-export bias that was implicit in the trade and exchange policies. The export promotion law has encouraged non-traditional exports such as melon, pineapple, and shrimp. This has resulted in substantially more foreign exchange earnings, as the exports of non-traditional products increased at an annual rate of 25% during the 1980-1984 period. This rate was reduced to 14% in 1985, due to weak international market conditions.

The export promotion law encouraged the development of short-cycle crops, such as melon and pineapple. The extensive use of fertilizers and agrochemicals that is required by those crops can eventually reduce soil fertility in addition to contaminating water supplies.

Export Taxes

Export taxes on agricultural products, mainly on the traditional products (coffee, banana, and sugar), can be regarded as a cost increase to the producer. However, these products (with the exception of sugar) are competitive in international markets. Export taxes also can be considered as a reduction of the domestic price, benefiting the local consumers. There is a 1% ad-valorem export tax applied to all exports (Decree 873/79), except banana, coffee, livestock, meats, sugar, and minerals which are subject to fixed taxes.

The purpose of establishing an export tax is to generate fiscal revenue. This tax represents 15% of the revenues raised from indirect taxes. The export tax reduces the price effectively received by the producer, discouraging production or promoting inadequate methods of land use.

The export tax on timber ranged from 10% to 18% up to 1988, depending on its quality. This tax was calculated on the CIF value of the timber exported. In addition, there is a fixed tax, so that the total tax in percentage terms is as high as 22%.

As of this writing, an additional tax is in place. It has been fixed at 12% of the CIF value. A 30% tax on the CIF value of timber exports has been recommended in order to reduce the rate at which the forest is being cut. This tax would be calculated on the banking system exchange rate.

Export Controls on Forest Products

COHDEFOR has had exclusive marketing rights to Honduran timber. This policy transferred the external marketing functions from a few foreign private companies to a state corporation, significantly increasing government revenue. Because of the large emphasis on COHDEFOR's export benefits, domestic prices of lumber suffered manipulations that discouraged new investments in the lumber industry. However, to a certain extent, it promoted investment in secondary wood products industry since these types of products were excluded from COHDEFOR's exclusive export rights.

The decision to give COHDEFOR an exclusive right to export lumber came after a number of studies revealed that little of the forest resource benefits

remained in Honduras. The exporting companies generated few jobs, most rented their yards, manipulated domestic prices of lumber, exported the great majority of their earnings, and declared but a very small percentage of the value and volume they exported.

The additional income generated by the exclusive marketing functions of COHDEFOR created savings that later enabled it to provide credit for the forest industries and, at the same time, made COHDEFOR an important subject for international credit. This provided internal savings that allowed for industrial and infrastructural development projects.

COHDEFOR development efforts were primarily in the softwood forest areas, making pine lumber its "cash crop." The tropical hardwoods became the target for spontaneous and directed colonization with the slash and burn agriculture that has had the highest deforestation rate.

Since the creation of the Executive Committee in 1983, exports have returned to private hands, but are exported in the name of COHDEFOR. The extent and effectiveness of export controls today are almost the same as they were before the creation of COHDEFOR.

Policies and Trade in Wildlife

Wildlife trade issues have become an important issue for the Callejas government. Trade in wildlife has not been effectively controlled, the participation by Honduras in international conventions and treaties notwithstanding. The problems of export of endangered species in Honduras is of such concern that President Callejas in one of his first official actions prohibited the export of wild animals pending determination on their status (Presidential Resolution 001-90).

Honduras is a member country of CITES, the Convention on International Trade of Endangered Species, as well as other international treaties and conventions. CITES has provided the basis for policy by Honduras. There are three parts or appendices to the treaty which establish various levels of protection. Appendix I prohibits trade of species in danger of extinction on a world-wide basis. Appendix II restricts trade of species becoming extinct because of trade. Appendix III lists species in danger of extinction in a given country. The last two categories require the exporting country to certify the export to the importing country.

CITES was established in 1975, ratified by Honduras in 1978 and export quotas enacted in that year. However, for various reasons the ratification was not presented to CITES until 1984.

RENARE has the official responsibilities for implementation of CITES. Actual responsibilities rest with the Customs Department in most cases. Unfortunately the individuals given the responsibility to give certificates are not qualified technically to do so. For flora it is very difficult to differentiate species. The national flower of Honduras, an orchid (Brassavola Digbiana) is difficult to identify from other orchids and is endangered. While fauna is easier to identify, the porous nature of the border leads to contraband

when there are problems with the quotas at the border check points. Diminishing supplies and strong demand in the U.S. will increase prices and continue to provide an incentive to poorer segments of the rural population to attempt to capitalize on the trade. The Honduran Ecological Society, among other groups, believes the allowable quotas for fauna are too high. There is presently only one documented case of RENARE successfully taking someone to court who was trying to illicitly export wildlife, in this case the popular parrot guaras rojas.

One of the issues with the current quotas is the lack of knowledge on the degree of problems faced by a given species. The Perfil Ambiental (1990) notes the lack of a basis of information, thus challenging the determinations currently in use and reported by CENTREX. It remains, however, to be seen whether institutional capacity will exist to adequately administer the quotas even given an improved information base. One suggestion to place a tax on exports while theoretically raising costs would also have implementation difficulties.

Many of these problems are driven by issues addressed elsewhere including concentration of land holdings, low returns to agriculture and various policies which encourage extensive cattle operations and thus put pressure on forests and other wildlife habitats. Shrimp development is also discussed elsewhere. However, two examples point to problems arising from the need to improve agricultural and other non-traditional exports. In one case the effort by some government entities including IHCAFE and FEPROEXAG to increase cardamon production can cause natural habitats to be destroyed. Analysis of this issue will need to account for both the costs and benefits of such policies. Another example is the development of crocodile farms for live exports as well as hides. This is creating a market which also encourages capturing of the few remaining wild crocodiles and caiman. There are, of course, many other examples where modern agricultural techniques systematically destroy habitats. Care will have to be taken to analyze the wildlife effects where such land conversion is controllable.

4.5 Summary Macroeconomic Findings and Issues

- Until recently the overvalued Lempira was an implicit subsidy for imports and an implicit tax on exports. This contributed to skewed prices against the agricultural sector compared to other sectors.

- Devaluation may shift production in favor of export crops.

- While pesticide use may increase as a result of an increase in short-cycle, non-traditional export crops, the prices of pesticides should increase with the elimination of the implicit subsidy for exports. Policies in neighboring countries may also affect supply and prices.

- The need to increase foreign exchange has led to policies which have some negative natural resource and environmental effects because of inappropriate input use or mining of resources.

- Devaluation and elimination of other policies which have skewed relative prices against agriculture will probably affect farm level prices but the results are not necessarily guaranteed because of intermediation and market structure.

- If prices do reach the farm level, the availability of other inputs, tenure, credit and technology will determine the ability of the farmer to respond by increasing productivity versus production. Increases in production can result from marginal land conversion and soil fertility depletion.

- Expansion of the money supply and inflation discourages long-term investments and encourages short-term trading activities which result in resource mining.

- Agricultural credit is available at subsidized rates to generally large operations involved in export crops and extensive cattle production.

- The conservative banking institutions finance generally short-term inputs and not long-term investments. Credit often goes to fertilizers and pesticides for short-cycle crops and not for soil conservation or Integrated Pest Management(IPM).

- The fiscal deficit limits the ability of the government to provide the services needed to protect the environment and natural resource management. Government deficits cannot be financed with domestic credit without increasing inflation. Internal sources of financing reduces the availability of credit for private sector activities. Longer term investments such as irrigation, drainage and soil conservation would not occur.

- Interest on foreign debt has been a primary factor in balance of payment deficits and is a source of pressure for increased exports to get foreign exchange. The payment of interest on the foreign debt leads to a shortage in foreign exchange and overvaluation of the Lempira.

- Resource using firms in such circumstances have difficulty in importing the technology needed to improve efficiency.

- Current expenditures (for salaries and wages) have rapidly expanded at the expense of capital expenditures. This represents a reduction in government investments in infrastructure needed to support economic development.

- Revenues from various resource management related taxes and fees are inadequate because of poor administration and failure to capture the economic gains or rents which should accrue to the government.

- Trade policies have been highly protectionist of the industrial sector thus biased against the agricultural sector.

- Most industrial imports were through the non-official exchange rate while agricultural goods were imported through the official exchange rate.

- Low returns to agriculture has resulted in more unemployment and underemployment and migration from rural to urban areas.

- Subsidized wheat imports have had a negative effect on corn production and increasing dependency on food imports. This discourage production of staples and increases pressure on forests by poor to increase their income.

4.6 Tenurial Policies

Tenure issues are critical components to decisions by resource users. This discussion will include analysis of land tenure and the important role of National Agrarian Institute, forest tenure, water law and ownership and the fisheries law.

Land Tenure Issues

Land tenure issues as well as property issues associated with forests and water must be understood in order to accurately and completely deal with resource use issues in Honduras. As described earlier Honduras as in many Latin American countries has highly skewed land distribution. This has resulted in the situation where the best quality land and the land with the least environmental fragility is organized into large extensively used ranches while highly erodible hillsides, forested areas and protected areas are over-used by the land poor. Furthermore, the government of Honduras has the power to grant title to land and give concessions to use forest, fisheries, water and minerals. In theory it also imposes conditions on titles.

Tenure or property control is a critical instrument of policy if change is sought to improve efficiency and sustainability in use of renewable natural resources and attain a more equitable distribution of the costs and benefits associated with their use. The government does not have the ability to adequately administer the authority it has assumed. Many of these resources have open access characteristics which lead to rapid depletion when general or localized population pressures increase within the context of skewed land distribution. Some problems are exacerbated by attempts to change distribution through agrarian reform legislation. For example, forested land is considered vacant and subject to expropriation. Even land producing basic grains were until very recently subject to expropriation or at least the threat of expropriation. Cattle ranches on the other hand are not subject to expropriation in any de facto sense because of the historic importance of cattle interests.

Such a situation can create pressures throughout the resource management regime in Honduras. There are significant problems for sustainable agriculture as erodible hillsides and fragile humid tropical lands are converted to marginal agricultural activity often for just a few years. The principal cause of deforestation in both the pine and broadleaf forests is this slash-and-burn practice. This has led also to increased soil erosion and down stream effects including siltation of hydroelectric facilities, sometimes within a few years of their installation. Attempts to establish protected areas within this context are unlikely to succeed. The attempt to establish protected areas is an effort to change a de facto resource regime. This changes the rules of access to the use of resources by people living near the areas. Inadequate enforcement of de jure changes often result in a disregard for the legal regime and intensified depletion of the resource base.

Resolution of these issues and the policy agenda associated with resolution will have to consider a wide array of possible changes. This will include land taxes and the information and legal structure needed to implement such taxes. Land taxes have the potential of improving the intensity of land now

extensively managed. Tenure security policies should examine a wide range of individual and group ownership systems. This can build on the certificates of possession in the LUPE project to policy analysis on long-term leases with roll-over provisions which can also give security of tenure within any meaningful economic planning horizon.

In Honduras, as elsewhere, the notion that national or even regional governments can effectively manage local natural resources is largely without empirical or historical support.(Bromley, 1989) All forms of ownership and management should be reviewed for potential improvements in their management. However, care must be taken regarding resource management under the private sector taken out of the context in which that sector makes decisions. Not only has experience shown that resources may not necessarily be better managed (depending on time preferences) but that better-off segments of society end up owning the land even if the original beneficiaries were rural poor. Neither can capital investment save resource regimes if institutional solutions do not also occur. As with other resource issues which are influenced by policies based on market solutions, care will need to be taken that distribution and long-term resource issues are properly accounted for and considered in the policy and policy research agenda.

National Agrarian Institute

The institution charged with the implementation of the agrarian reform law is the National Agrarian Institute (INA) which is a semi-autonomous government entity. In addition to resolving all matters relating to land tenure, exploitation, recuperation and distribution, INA is charged with organizing and managing the National Agrarian Cadastre and the Agrarian Register.

The Agrarian Reform process in Honduras was intensified upon the issuance of Decree No. 170 of December 30, 1974, containing the agrarian reform law presently in force. In addition to awarding parcels and titling land, it provides technical and credit assistance to the beneficiaries. It was intended to improve the productivity of land through the transference of idle land occupied by large landholders, or inefficiently used land, to rural families without land. This law was conceived as an instrument to replace minifundia and latifundia through a system of land ownership, tenure and land use that guarantees social justice and increases production and productivity in the agricultural sector (Art. No. 1).

Expropriation of agricultural land is based on the size of the farms and the efficiency of land use. The law establishes ceilings on the size of holdings and establishes guidelines regarding the efficiency of land use. In addition, tenancy, sharecropping and other circumstances became reasons for expropriation.

The ceilings established took into consideration the relation between availability of agricultural land, its productivity and agricultural population. However, it is generally understood that the ceilings are very high. Effectively, it promotes extensive livestock operations. The law incorporated indicators of the carrying capacity of pasture land, on the basis of what cattle ranchers reported as economically viable. Due to the low prices of meat in international markets at that time, and the low quality of Honduran beef in

international markets, the pasturage coefficients allowed for extensive cattle operations rather than encouraging intensification.

The law gives immunity from expropriation to small farms of less than 50 ha. that are efficiently cultivated, trying to protect the small and medium producer. Likewise, to protect important agricultural activities, the banana, plantain, oil palm, sugarcane, coffee, pineapple, citrus and tobacco plantations were declared immune to expropriation.

The law states that a farm is efficiently cultivated when 90% of its area is covered with permanent plantations, or planted in the compact manner of a commercial exploitation. Scattered plants are not considered permanent plantations. This has encouraged the cutting of trees to avoid being subject to expropriation. In the case of annual crops, one annual harvest should be obtained when their vegetative period is more than 6 months, and two harvests when the vegetative period is less than 6 months, as in the case of corn, in order to have the land qualify as efficiently used.

In the case of cattle ranches, efficient exploitation exists when 90% of the plot is covered with pasture and has a certain quantity of livestock per hectare, depending on the region. That ratio is 2 to 1 animals per ha. in some regions, or 1 per hectare in others, and 1 per 1.5 half hectare in yet other regions. No in-depth research has been made to determine how many head of cattle per ha. can be economically viable or, in other words, up to what point cattle raising can be intensified.

The law states that land to be inefficiently exploited under the following conditions:

Irrigated land:

- When the lack of drainage causes floods or partial or total inundation of the plot.
- When the irrigation systems are damaged due to lack of maintenance or timely cleaning.
- When erosion is caused by poor irrigation.

Land without irrigation:

- When the soil has been eroded or exposed to erosion by rain because of inadequate agricultural or cattle raising practices.

Cattle raising land:

- When there has been indiscriminate burning of the pasture during the last two years, or when the burning has been done without the corresponding authorization.

In spite of the above regulations, private land subject to expropriation according to these guidelines is approximately 77,000 ha. which represents only

6% of privately owned land. The lands expropriated have been mainly national lands that were privately tilled, and to lesser extent, fee simple land. Up to 1988, 455,175 ha. had been expropriated, of which 72% was national land, 17% was privately owned and 10% was municipal land.

To date, land titling has benefited 2,050 associative farming groups with a total of 51,906 members, a population of 279,528 inhabitants, about 19% of the farming population. It is estimated that there are 125,000 small landholders and 150,000 landless rural families.

INA's land distribution procedures have been slow. This has left unsatisfied demands from the peasants as well as frustrated expectations regarding the implementation of the law. This situation has encouraged invasions of agricultural land and, even though such invasions are illegal (the law states that those who invade lands can not become beneficiaries of the agrarian reform), INA has ratified and supported the situation. The distribution of land responds mainly to the pressure of organized groups that invade land and afterwards claim it, and not to an action plan prepared by the institution.

The agrarian reform law limits the land market and the access to credit. Article 24, paragraph d) bans land rental. Article 96 establishes that lands granted to beneficiaries in conformity with the law cannot be mortgaged. Article 106 bans the sale or transferral of land ceded to a cooperative; and it prohibits taxing or otherwise levying charges on that land, with the exception of loan recovery charges by public credit institutions. The difficulty of purchasing, selling, and leasing land limits its efficiency of use, since it sometimes forces the land to be kept in the hands of inefficient farmers and/or devoted to a less productive use. That is the case, for example, of livestock and sugarcane.

The land distribution policy contains the following provisions:

- Beneficiaries of the agrarian reform law, cannot already be landowners.

- Plots will not be distributed in sizes of less than 5 hectares.

- The beneficiary must prove that he has been tilling the land in question during the 10 years up to the issuance of the law.

- To be part of a cooperative or other associative farming enterprise.

The agrarian reform law advocates the redistribution of land to organized groups, whether they are cooperatives or associations, and only exceptionally to individuals. The organizational scheme of state cooperatives has presented serious problems. One of the most criticized aspects is the high rate of abandonment of the settlements and the low density of use of the land distributed. The reasons for the abandonment are diverse, among which is the low productivity of those groups. The low productivity in turn is due to the concentration on basic grains crops, to the lack of management skills and to a high accumulated level of debt. The campesino groups do not own the land until they have paid its total value. They have 20 years to pay, but during that

period they cannot mortgage it. In fact, the arrears on these payments is very high, so virtually none of them attain title.

Furthermore, the law states that the government shall take all the actions needed to achieve the objectives of the law including providing technical training and credit. The technical assistance covers two areas: training in matters relating to the organization of the settlements (asentamientos) and cooperatives and conventional technical assistance in production technologies. This assistance is given at the field level or through training courses. INA also provides technical assistance in the administrative and managerial areas. However, it is not well developed since the training is given only in basic accounting. In granting loans, INA consults with BANADESA, applying the same banking principles as BANADESA with regard to interest rates, terms and guarantees.

Agrarian reform is one of the keys to the performance of the agricultural sector through the contributions of the agrarian reform groups to sector production and because of the generalized insecurity of tenure resulting from this process. Insecurity is a deterrent to any kind of investment in the sector and to the adoption of new technologies. This situation affects directly the natural resources and the environment, since the land is neglected or inappropriately managed in many cases.

A relevant element of the problem is that the country does not have a complete agrarian cadastre nor an agrarian registry. This situation affects the implementation of the law, since there is no systematic record of how much land is available and what is its potential use. On the other hand, the lack of an updated registry of the beneficiaries makes it difficult to control the abandonment of land.

The agrarian reform law has hampered attempts to increase productivity and investment in the sector. The constraints created by the insecurity of tenure and by the inefficient organizational form of the cooperatives do not encourage investment for long-term land improvements, and there is virtually no access for new and more efficient producers that could be attracted by an active land market. Thus, the deterioration of the resource base continues and future production is jeopardized.

Agrarian reform has affected land use patterns, efficiency and productivity. This is particularly the case of cattle ranches that occupy large areas of agricultural land, generating less employment than other agricultural activities. The requirement that 90% of the land has to be covered with permanent crops has encouraged deforestation. This has encouraged the expansion of livestock operations, increasing the pressure on the forest, and damaging the soil. On the other hand, the use of agricultural land for pasture limits the availability of this scarce resource, pushing small producers to marginal areas and hillsides, and increased pressure on the forests.

Tenurial Issues in Forestry

Article 5 of the Forestry Law 103 (January 10, 1974) establishes that it is the concern of the State, through the Honduran Corporation of Forestry Development (COHDEFOR), to control all the forests located on public or private forest areas. That same article also establishes that when these forested areas fall under private ownership, the landowner shall be obligated to act according to the forestry programs that COHDEFOR may establish for them; and that, if they comply with all their obligations, they shall have the right to receive the incentive that COHDEFOR may establish, and to receive payment for the forest products that may be extracted from their property.

In addition, Article 29 of the same law, states that COHDEFOR, the companies it may establish as well as campesino associations or forestry cooperatives have the right to use those private lands that may be necessary to fulfill their objectives.

The General Forestry Regulation, Resolution 634 of April 9, 1984 (more than 10 years after the Forestry Law 103 went into effect), in its Article 32, establishes that the property of the soil of private forest lands shall belong to its landowner but that the control of the forests, as well as of those areas of forestry aptitude (undefined) that can be reforested, shall belong to COHDEFOR. Article 33 of the same Regulation, adds that private forest lands are linked to the objectives of public interest mentioned in the forestry law, such that they are subject to public easement, as established by Article 29 of the Forestry Law 103.

COHDEFOR has legal control over all forests. However, little control is exerted over the expansion of the agricultural frontier and the sawmill logging areas. The management priorities of COHDEFOR have been on lumber exports rather than on implementing sustainable forest management programs on a national basis. As the administrator of the state-owned timber, COHDEFOR has therefore had little or no effectiveness, particularly at the local or rural community level.

In 1986, based on the experience gained through an FAO/COHDEFOR project (Integral Forestry Development for Social Benefits Project), the concept of Integrated Management Areas (AMI) was introduced (Barahona, 1986). This concept is founded also on Article 24 of Forestry Law 103 that states that COHDEFOR shall organize the Forestry Social System, constituted by Honduran campesinos, associated in working groups, cooperatives or other associative forms. Likewise, the General Forestry Regulation's Article 13 establishes that integrated "modules" shall be promoted, constituted by groups of campesinos with homogeneous interests. The AMI general objective is:

> To carry out a sustainable forest management by achieving its utilization, protection, improvement, conservation, and increment, and contribute to the improvement of the living conditions of the 'campesinos' living in forest lands, involving them, in group or in associative form, in all the forestry activities, and making them participate in their benefits. (Barahona, 1986)

The AMI are forest areas between 1,000 and 10,000 ha. that correspond to the jurisdictional area of one or more rural villages, depending on their common characteristics of topography, road and communications networks, and other factors. In these AMI, a professional forester must live, who, in conjunction with the community, and through their most representative organization, will participate in the integrated development of the area, based on the sustainable management of the forest. There are presently some 400,000 ha. of forests being managed under this concept (90% in coniferous and 10% in hardwood forests). As of 1987, some 50 AMI were under way, involving some 2,500 direct beneficiaries (Perfil Ambiental, Draft, 1990).

The AMI concept appears sound in its basic forest management objectives. Nevertheless, there are a number of considerations that should be taken into account: (1) AMI have to be well planned in order for each to yield equitable benefits for all communities. Forests are not all the same and their degree of deterioration may be significantly different. AMI cannot be planned sort of "on the way" as the manual indicates (Barahona, 1986) because mistakes can be made, which may cause further frustration of an historically deceived population. (2) The expectations that the local forester is going to solve all the rural development problems of these AMI communities are too great. This is not the role of the foresters nor of the forests and, again, credibility may be immediately lost if goals and expectations are too high and unrealistic. (3) On the other hand, it seems that the proposed community participation in the forest management activities is too modest and will only make them primarily salaried communities since most of the contemplated activities either yield marginal benefits, compared to industrial harvesting, or else, they are management activities paid for by COHDEFOR. (4) COHDEFOR has also implemented Tributary Areas for the forest industries that do not necessarily coincide with the AMI boundaries. Each of these areas should support, on a sustainable basis, the industry that it supplies. However, in many cases, the local communities are not involved in the harvesting, transport and supply activities, thereby creating a further conflict with the sawmills, the logging contractors, and COHDEFOR.

Some forest cooperatives existed prior to COHDEFOR but most have been promoted and created by COHDEFOR in compliance with its Forestry Law 103, that refers to the Forestry Social System (FSS). However, with the exception of the few that hand-saw hardwood lumber in the North Coast, and some that collect minor forest products, such as pine seed, most have an exclusive dedication to resin extraction. (In 1986, there were 104 forestry cooperatives with 4080 members, in 8 of the 9 Forest Districts in the country). In most cases, secondary product extraction provides marginal revenue to these groups and monopoly in the domestic market price (there are only two buyers in the whole country), so many groups have failed over the years. In spite of these problems, the average annual income of these cooperatives is in the order Lps.3.3 million, an equivalent of Lps..809.00 per member, which is almost twice the average income of the small rural producer that lives in forest areas (Perfil Ambiental, 1990).

Private land rentals are prohibited by the Agrarian Reform Law. Nevertheless, a common practice among the larger land-owners has been to "lend" forested lands to landless campesinos for two or three years, with the condition that they clear the forest and that, before they leave, the area is covered with pasture (sometimes at an additional cost). This process has been a major factor

in the conversion of forest lands into pasture, as can be observed in the following exhibit:

Exhibit 4.2

PASTURE LAND AS PERCENT OF ALL LAND
HONDURAS, 1952 and 1974

Farm stratum (ha.)	1952 (%)	1974 (%)
< 5	6.58	10.79
5 - 10	14.14	26.93
10 - 20	18.46	36.82
20 - 50	26.11	48.99
50 - 100	37.50	60.91
100 - 200	38.62	69.31
200 -1000	33.38	71.19
>1000	35.15	55.55
TOTAL FARMS	28.15	51.19

Source: Howard, 1989.

Although this type of tenure may include a large proportion of those that occupy state lands, many of those that fall under this type of informal arrangement are also included in this land use pattern change. In addition:

Exhibit 4.3

LAND TENURE ON CATTLE FARMS
HONDURAS, 1982

Type of tenure	Percent of # of farms(*)	Percent of Area
Individual Private	44.6	52.4
Collective Private	10.5	7.4
Usufruct	51.5	37.1
Other	4.7	3.1

(*)Add up to more than 100 because of double responses in the 1982 Cattle Survey.

Source: Howard, 1989

The 37.5% increase in pastures on farmlands, during the 1952-1965 period, caused a reduction in 36.7% of the farm area under forest cover. There has also been a significant reduction in the fallow areas, which also generally imply a forest cover loss since the fallow areas have secondary forest regeneration. The expansion of the cattle frontier has been at the cost of forest cover, primary or secondary. This trend has not changed, but rather has significantly increased. Between 1974 and 1982, there was an increase of pasture area of 900,000 ha., reaching a total area of 2.2 million ha.

Water Law

Ownership of water has been governed by the Water Law of 1927. Proposed revisions have been under review since 1985. Both the existing and proposed law are strongly oriented to state ownership and management of water. Almost all water is considered property of the state. The exceptions include groundwater and water that begins and ends in a single property. The state officially determines water uses. Free and uncontrolled uses include water for drinking, cattle, non-commercial navigation and sporting. Other uses require permits or concessions. Priorities for use include: domestic, agriculture, energy, mining, industry, fishing and others. All concessions are expected to pay the user fee and taxes discussed above. Duration of concessions are made on a case-by-case basis. Principal institutional problems are the slow bureaucratic procedures and high costs for rural users. Given these issues and limited staff and budgets, the law has not been very effective in controlling resource issues of either drawing from the resource or pollution of the resource.

The proposed water law would establish a water authority with responsibilities to prevent loss and inefficient use of water, establish protected areas, prevent dangerous activities and pollution and limit salinization. Poorly maintained government irrigation systems run at 30 percent efficiency. EL Cajon dam was constructed without a complete examination of siltation problems which has curtailed other hydroelectric projects. Some water resources are polluted by heavy metals and run-off from agricultural pesticides. Salinization is a problem in the Choluteca valley (where a large irrigation project is planned.)

Other agencies also have authority over various aspects of water use. These include INA irrigation projects and COHDEFOR watershed responsibilities. An institutional attempt to coordinate these activities seems justified but will not address overall institutional weaknesses and the inability of the state to adequately administer the powers it has assumed.

It also should be noted that surface water problems have also led to groundwater issues in some areas of the country. Since groundwater is privately owned but often drawing from an open access resource there are examples where depletion is occurring rapidly from both over-use and decreasing recharge from severely denuded watersheds.

Thus water ownership in both its public and private forms fails to address the nature of the resource and/or the ability of the state to meet the obligations it has assumed.

Fisheries Law

The Fisheries Law, enacted in June of 1959, remains the official reference for fishery policy in Honduras and is complemented by the Law for the Exploitation of Marine Natural Resources which was enacted in 1980.

The Fisheries Law states that its objective is the conservation and propagation of stream, lacustrine and marine flora and fauna as well as their exploitation, commercialization and industrialization. The Law does this by regulating all fishery activity including that which is considered continental, marine, industrial, artisan, scientific, for sport, domestic or other. The regulatory mechanisms in this law include the registry of all fishermen, merchants, business interests, and most fishery equipment for which a permit is issued. Other regulatory mechanisms include the seasonal prohibition of certain fishery activities, prohibition of certain fishery methods (use of explosives or toxic materials as well as the use of harpoons, etc.), prohibition of certain fishery activities without adequate permits.

In addition, Article 46 prohibits fishing in areas where aquatic species reproduction and growth occur. Article 52 prohibits the destruction of mangroves and other forested areas on shores of rivers or downstream thereof, lagoons, seashore areas and others that serve the preservation of aquatic species.

The Law states a preference for, in the case of conflict of uses, domestic, cooperative and artisanal fishery activities.

Article 80 states that all conflicts between interests relating to stipulations in the law or other fishery activities must be presented, evaluated and resolved by the Department of Hunting and Fisheries.

The Law for the Exploitation of Marine Natural Resources establishes the marine rights of Honduras (territorial limits) and provides for the national jurisdiction over the control of natural resources within the marine territories as well as the control for the preservation of the marine environment, foreseeing the need to control and reduce all pollution and species destruction.

The Fisheries Law has at various times proved to be an effective regulatory instrument when it has been applied by trained inspectors of the Ministry of Natural Resources. Captures have been impounded, fines charged and violators imprisoned for committing acts prohibited by the Law. However, in recent years, the Department of Hunting and Fisheries has not heavily enforced the Law due to lack of political interest in doing so within the Ministry. In 1988, only 84 inspectors were employed by the Department. Recent performance has been poor and contributed to resource management problems.

Tenure Findings and Issues

- Land holdings are highly skewed and the best quality land with the least environmental fragility is organized into large, extensive cattle operations. Smaller, untenured farmers operate on erodible hillsides and/or in slash-and-burn activities in tropical lowlands.

- The government has assumed ownership of most land, water and forest resources but lacks the ability to manage the resources.

- Land planted to basic grains has until recently been subject to expropriation.

- Ceilings on the size of holdings are high and when seen with other factors help promote extensive cattle operations.

- Trees have been cut to avoid expropriation since forests are considered vacant land. INA requires that ninety percent of land has to covered in permanent crops. This leads to cutting of forests in the INA settlement areas. None of these regulations or procedures address land suitability.

- There are many potential land tenure arrangements available to encourage sustained resource management. No one system will provide all of the answers. Private property or ownership does not necessarily result in sustained use if the operators are functioning in a short-term trade versus long-term production environment. Communal tenure arrangements can break down with over population or poor technical support. De jure government ownership has however not resulted in de facto control or in sustainable resource use.

- The Agrarian Reform Law bans land rental or mortgages which impedes the land market. Titles are not granted for twenty years when land value has been paid off. This has resulted in a high rate of abandonment.

- COHDEFOR legally controls trees on private lands even though the soil belongs to the owner. This legal control is mostly ineffective and has not been management oriented as COHDEFOR has concentrated on production and marketing activities.

- AMI (Areas de Manejo Integrada) and Tributary Areas have not been properly managed or supported. They have also often conflicted with each other territorially.

- While the government has legal ownership of most water in Honduras, environmental and management issues are not effectively addressed. Pollution is uncontrolled, irrigation infrastructure is small and deteriorating, and groundwater is being depleted because of watershed destruction.

- The government has legal ownership of all fisheries and regulates extraction activities. It prohibits destruction of mangroves. Enforcement of these legal powers has been weak.

- The government of Honduras as a member of CITES regulates the export of endangered species. This control is ineffective and will likely remain so given high international demand and the income potential this trade supplies to the poorer elements of the population.

4.7 Regulatory and Sectoral Policies

This section will review regulatory and sectoral policies within the context of the four problems areas defined in this analysis: sustainable agriculture, production from natural forests, watershed management and wildlands protection.

Sustainable Agriculture

Overview

Given the importance of agriculture to the economy of Honduras, those policies which affect the agricultural sector may have significant influences on resource use decisions by, primarily, affecting the returns to agricultural production. The policies assessed below include the role of IHMA and producer prices, the basic grains law, retail price controls and BANASUPRO, BANADESA and pesticide use and regulations.

IHMA (Instituto De Mercadeo Agricola) and Producer Prices

IHMA was chartered by Decree No. 592 in 1978 as a successor to the Division of Cereals Storage and Marketing of BANADESA. It has had an import monopoly on basic grains, including wheat and the PL 480 program, and a guaranteed price program. IHMA sets guaranteed prices (based on the cost of production) to the producers of basic domestic products, controls foreign trade in those products, and owns and operates storage facilities. IHMA also collects information on production and markets and provides technical marketing assistance to private and public agents. It has confined its operations essentially to four basic commodities: corn, beans, sorghum and rice. In theory IHMA would buy when there is an over-supply and sell when there is an under supply. IHMA would buy from producers and transport the commodity to their stores. In practice IHMA affects only 10 percent of basic grains production and lacks the working capital to compete with intermediaries. It has chronic financial deficits. It buys from intermediaries and very little from small producers. With the exception of a small effect on rice prices, it has had no perceptible influence on basic grain prices.

IHMA has not had an adequate budget or government subsidy for its operation which has resulted in large budget deficits. While IHMA's operations are widespread geographically, in many cases producers are unable to sell directly to IHMA and therefore do not receive the guaranteed price. Also, sometimes IHMA is unable to make timely payment. IHMA does not buy from all producers but only those who are registered to sell to IHMA. In the country as a whole, there are 2,799 producer groups and 3,351 individual producers that are registered with IHMA (as of May 1986). This represents a minority of producers.

The analysis by Garcia (1988) concluded that:

> Statistical analysis of IHMA's operations revealed the following: (1) the imports, and more so domestic production, put downward pressure on domestic prices when they increase, not surprisingly; (2) that for corn, beans, and sorghum, variations in the guaranteed price had no perceptible

effect on the wholesale market price; and (3) that the volume of IHMA's purchases (except for sorghum) did have an influence on the market price -- in a downward direction as the volume increased. These results suggest that the net effect of IHMA's operations is not to the benefit of farmers, that the guaranteed price is not an effective policy instrument (as it is administered, and that IHMA provides some net benefit to consumers. The first of these conclusions is reinforced by information that shows that only a minority of farmers are able to sell directly to IHMA, and that often IHMA payments to participating farmers are delayed. (Garcia, 1988, p. 129)

The USAID Agricultural Sector Strategy suggested a number of changes for the role of IHMA. These include elimination of the IHMA import monopoly, shifting IHMA to a food security role but protecting against temporary and extreme price fluctuations, removal of domestic price controls on coffee, milk, sugar and other commodities, and withdrawal from storage and seed production activities.

As a result of the incoming administration a decision was taken to privatize the IHMA silos as well as free the basic grains imports. Also studies are being carried out to modify IHMA's function and abolish the system of guaranteed prices based on production costs. These would be replaced by price bands based on the international price plus transportation and internal marketing costs, and by a 30 percent tariff to protect the producer from the fluctuations of international prices and protectionist policies of the developed countries. These would therefore be minimum and maximum price bands. Financing problems will also have to be addressed. Studies are also underway to privatize the production of improved seeds. Several other public enterprises are being privatized as well, including the two state-owned sugar mills, the government's dairy plant and the National Livestock Center.

The structure and operation of IHMA contributed to the decline in relative prices for agricultural products. Should the changes being discussed be completely and adequately implemented, there may be improved incentives to use better technology for production of basic grains. There could also be increased incentives to plant even more marginal areas to these crops since it is the poorest element of the rural population which depend on these crops. They either have to buy what they cannot produce or find additional land. Thus pressures on the natural resource base in terms of soil mining and pressure to expand the agricultural frontier could be an outcome. Suggested changes in policy may also affect the relative returns between export crops, especially non-traditional exports and basic grains production.

The Basic Grains Law and Wheat Imports

The importation of basic grains, especially wheat through the PL 480 program, has contributed to lower prices for domestic grains, especially maize. While there clearly are economic gains from PL 480 activities in terms of balance of payments, reduction of malnutrition for some groups and funding for development projects and government activities (33 percent of the Ministry of Natural Resources budget comes from PL 480), wheat is entirely imported and pricing policies have encouraged the substitution of wheat products, at the

margin, for corn and traditional staples. Some grain imports will be needed in the short to medium term. The government is currently importing maize at a cost of foreign exchange.

In 1989 the government of Honduras passed the Law of Incentives for Basic Grain Production. It supports directed and concerted activities to increase the production of maize, sorghum, rice, beans and soybeans by the provision of credit, low tariffs for inputs (since amended by the new government), technical assistance and road and irrigation support for basic grain production. From the point of view of tenure and the activities of INA, the Basic Grains Law exempts land planted to these crops from expropriation. This and the other aspects of the law could possibly change the relative preference for cattle production and cause some cattle land to be converted to grain production. It is too early to determine the effects of the law, but it must be noted that the price effects of wheat imports will continue to dampen incentives for increased production of these crops. It should also be noted that some skepticism exists in terms of the effect of the law in reducing the potential for expropriation of land producing basic grains.

Retail Price Controls

Honduras fixes the maximum prices of a significant number of foods and other basic products at the wholesale and retail level. This system was established by Decree No. 502-81 in December, 1981 and modified by Decree No. 460-86 in July, 1986. There was a total of 63 products controlled in 1986 (Garcia, 1988). Products currently controlled include sugar edible oil, coffee , chicken, wheat flour, eggs, powdered and fluid milk, margarine, bread, pastas, butter and salt. Other products controlled include detergents, toothpaste, pencils, fertilizer, cement, petrol derivatives and other fuels.

Price controls are difficult to implement. The human resource analytic capacity to account for demand and supply conditions in setting prices is scarce and errors in these determinations can have significant results.

> When prices are set too low, assuming that compliance is enforced, the supply of goods brought to the market will be too small to satisfy consumer demand at that price -- the reverse of the intended result. As a result, some consumers will be denied the opportunity to purchase the goods, marketing establishments may be encouraged to participate in the parallel or black market. The supply shortages also will tend to become more serious over time, as producers of the controlled commodities shift more of their resources into producing other commodities which are not subject to price controls.
>
> Setting price above the equilibrium price can also be counter-productive. When there is insufficient competition among the selling firms, for example, these firms may be tempted to set their prices at the maxima even when lower prices would cover their costs and allow for a reasonable return on their investment. This again leads to a situation that the price controls were intended to eliminate. If, on the other hand, sufficient competition does exist in the market, prices will reach their equilibrium level -- below the maxima in this case -- independently of the

ceiling prices. In other words, consumers, including low-income consumers, benefit more from competition than from price controls. (Garcia, 1988, pp. 69-70)

Many of these characteristics exist in the Honduras situation. There are few personnel to enforce the rules although in those cases where infractions have occurred these results have been highly publicized. Though the controls are often ineffective, the cases where they are effective can lead to, among other things, inefficient production. There are a number of important examples which affect natural resource and environmental conditions.

Consumer price controls have contributed to lower returns to agriculture thereby affecting unemployment and underemployment in that sector, reducing production and investment and increasing pressure on the resource base. Sugar subsidies have cost approximately Lps.75 million per year. Sugar production has, therefore, had incentives to use higher levels of pesticides. This has also kept more land in sugar production at the expense of other, probably more efficient uses, such as grain production. Low milk prices encourage extensive versus intensive cattle production and increasing cattle production pressure on forest and wildland areas.

BANASUPRO (Suplidora Nacional de Productos Basicos)

BANASUPRO is an autonomous public entity that owns and operates a chain of food stores throughout Honduras. The purpose of these operations is to supply basic foods at stable and subsidized prices to consumers. It was formed officially in 1980 though some of the activities had already commenced under other institutions. The mandates include regulation of the prices of basic food commodities and reduction of food prices. In addition, this activity was to assist lower income groups, increase the efficiency of the retail distribution system and improve nutrition. The fundamental approach of this kind of activity is an attempt to affect prices based on the rationale of the existence of monopolies.

However, as is often the case with this kind of program, BANASUPRO has wandered in significant ways from its mandate and has become a costly, inefficient drain on government resources(and would have been even more so without assistance from the European Economic Community). Some research has shown that there is no significant price differences between BANASUPRO and other store prices. For officially controlled prices BANASUPRO sets its prices at the maximum price, therefore it could not undersell the private sector in the most important products directed at the poor. BANASUPRO also offers less services (fewer hours, no credit, etc.). Stores are also not concentrated in poor communities. Even so operating costs have chronically exceeded the value of sales.

Many of the reforms which have been suggested have the potential for improving the income situation of BANASUPRO but ignore mandated efforts for the poor. While dealing with the political issues associated with changes away from food subsidies for the middle class may be difficult, there may well be a role for a significantly reorganized BANASUPRO as a result of the other policy changes currently taking place. As suggested by Garcia (1988), there could be a role for

BANASUPRO as a targeted food subsidy program for the poor. It would require major structural changes. Nevertheless, the increase in returns to agriculture which should result from among other things the exchange rate reform will increase prices of basic commodities for the poor. This would suggest a targeted commodity approach as well as some geographically specific efforts.

From a natural resource point of view, policies which increase returns to agriculture, especially for basic food commodities, can have two important effects. They can increase production and/or productivity. Production increases could come at the expense of soil fertility from overly intensive use of a given unit of land. Productivity can result in increases in pesticide and fertilizer use. On the other hand the effects at the consumer level, especially the rural poor who have to buy some of these commodities, will be to lower nutrition or to increase marginal land conversion on hill sides or in tropical forest areas.

BANADESA (Banco Nacional de Desarrollo Agricola)

According to CONPPA (1990) there are a significant number of problems which have accumulated with respect to the public credit institutions designed to support agricultural development. These include:

- large arrears in credit payments to BANADESA and INA;
- these arrears are contributing to fiscal debt problems;
- these arrears are also preventing credit from reaching the reform sector to which it was initially targeted;
- only 10 percent of small producers have access to institutional credit;
- a significant amount of the credit has gone for non- agricultural uses;
- much of the credit has gone to larger producers;
- with the exception of IHCAFE there are no funds available for medium to long term loans;
- subsidized credit has meant that activities getting credit have not necessarily been the most productive or efficient;
- the capitalization of BANADESA and the savings and credit cooperatives has been deficient.

BANADESA was created in 1950 as the Banco Nacional de Fomento. It receives government funds, rediscount lines from the Central Bank and external funds. Since its founding BANADESA has lost much of its autonomy. Forty percent of its credit portfolio is in arrears. In 1988, 17 percent was cattle, 9.5 percent was industry, 3.4 percent was commercial, 66 percent was agriculture loans. Many of the cattle and agricultural loans are directed to large land owners. Another large segment includes loans to parastatals. Most of BANADESA's loans are made

at less than market rates. Thus loans are rationed in other ways than price, including politics. These loans are usually short term and do not address medium and long term investment needs. In addition, BANADESA is decapitalizing. Large private borrowers and public sector agencies are the most significant groups in arrears. Seventy-five percent of the arrears has existed longer than a year.

These problems and issues have various economic, equity and resource consequences. The lack of credit to small farmers and reform sector institutions reduces the ability of these groups to use appropriate technology to improve their productivity and production. This would increase pressure on the agricultural frontier as well as increase pressure to mine resources. Additional credit available to these groups should alleviate some of these pressures. However, as noted elsewhere in this report, procedures for loans should allow for input technology supporting IPM techniques as well as pesticides and fertilizers. Of course, particular resource management concerns arise from the emphasis on cattle credit. As a result of cattle having special access to subsidized credit its activities have an economic advantage over other agricultural or forestry uses for the land. Indeed, this forms part of the pattern of polices which favor cattle production and result, in part, in the destruction of forests. The decreasing amount of credit through both BANADESA and INA prevent the adequate use of lands in the reform sector. The lack of availability of long-term credit will prevent investment in resource conservation and productivity practices.

It is also important to mention the role of IHCAFE (Instituto Hondureno del Cafe) in the development of coffee activities in the Honduras. This institution has a wide ranging set of responsibilities including provision of inputs, credit, technical assistance, etc. While the agency is mandated to increase productivity versus expanding area of production, numerous factors, including favorable world coffee prices, have led to expansion of coffee growing areas. This can sometimes improve watershed conditions, if the changes are away from field crops. On the other hand, some coffee production activities (supported by concessionary credit) has occurred in designated protected wildland areas such as La Tigra near Tegucigalpa. Some analysis has suggested that IHCAFE has not concerned itself with environmental issues. Nevertheless, coffee has proven to be a viable crop for small farmer activity in Honduras and as such, in the aggregate, improves rural economic conditions. Finally, it should be noted that a coffee tax of 10 Lps. per quintal support IHCAFE (7 Lps.), municipalities where coffee is grown (2 Lps.) and AHPROCAFE (Asociacion Hondurena de Productores de Cafe)(one Lempira). This tax increases the cost structure for the small coffee producers.

Pesticide Use and Pest Management

The official pesticide management policy of Honduras is contained in the Plant Health Law (Ley de Sanidad Vegetal) of 1967, the Regulatory Act for the Registry, Import, Manufacture, Storage, Transport, Sale and Use of Pesticides (Reglamento de Registro, Importacion, Almacenamiento, Transporte, Venta y Uso de Plaguicidas), which was passed into law in 1980, and the Regulatory Act for the Control of Pesticides, Pharmaceutical and Biological Products of Veterinary Use, which became law in 1981. The execution of these laws is the responsibility of the Ministry of Natural Resources, specifically through the Plant Protection Program in coordination with the Livestock Program Control Office.

The Plant Health Law establishes the means by which the Government of Honduras can act to prevent and control the introduction of plant pests and diseases that threaten crop production. One of the seven responsibilities of this law is the regulatory control over the import, sale, use and application of insecticides, fungicides, herbicides and acaricides with the objective of protecting human, animal and plant health as well as the agricultural economy.

The Regulatory Act relating to the management of pesticides establishes more detailed control over activities related to the importation, manufacture, storage, transportation, sales and general use of pesticides. The Act requires that all pesticide importers or producers register their products and their uses with the Ministry of Natural Resources. It also establishes the safety measures that must be adopted by and for those people whose work requires their exposure to pesticides. The same Regulatory Act establishes protective measures to be applied in any of the activities in order to prevent harmful exposures of pesticides to the human and animal population. The Act establishes sanctions to be imposed in those cases where violations are discovered.

The Regulatory Act which establishes control over pesticides, pharmaceutical and biological products used by veterinarians specifically prohibits the manufacture, storage or commercial trading of these products where food is prepared, stored or sold in order to prevent the contamination of animals, people or other objects. This is widely ignored.

A proposal to reform The Plant Health Law has been elaborated by a special commission composed of representatives from the Division of Plant Health from the Ministry of Natural Resources, the Center for the Study of Contamination Control from the Ministry Of Health, the Department of Scientific Research from the National Autonomous University of Honduras, the Division of Occupational Health and Industrial Hygiene from the Ministry of Labor and the Department of Interior Commerce from the Ministry of Economics. However, the proposal has not yet been presented to the highest authorities in the Ministry of Natural Resources. Of particular importance is that the proposed reforms include a complete chapter on pesticides, which the present law only mentions in a subsection of an Article. The new chapter would require that all commercial distribution centers of pesticides and herbicides have a registered agronomist in charge of quality control over sales, much the same way a pharmacist supervises the sales of medicines in pharmacies. The proposal also establishes tolerance levels for the consumption of pesticide residues, using the international CODEX Alimentarius published by the Food and Agricultural Organization of the United Nations. The proposal includes several other important considerations not mentioned in the Regulatory Act that pertain to quality control of agricultural chemicals and to the analysis of agricultural products to determine pesticide residues before commercial distribution.

The inability of the Ministry of Natural Resources to apply the regulations established to control the risk of pesticide contamination weakens its legal authority, particularly with pesticide manufacturers and distributors. There are approximately 430 registered distributors that are visited very occasionally (about 9 per year and usually on complaints) by an inspection team made up of one representative each from the Ministries of Health, Labor and Natural Resources who prepare a report. This team is not considered sufficient for the job of

supervision nor qualified to conduct these inspections. They lack numbers and training to be able to do an adequate job.

Technical personnel within the Ministry believe that many pesticides, herbicides, antibiotics and other biological products are being sold by individuals or commercial distributors who have not been registered to do so. This is occurring more in rural areas, particularly in the south, because of the heavy commercial activity with El Salvador and Nicaragua where costs of these products have been much lower (due to government subsidies) as compared to Honduras. It is difficult to determine the magnitude of this illegal commerce of pesticides but if costs continue to rise in Honduras for these products while they are subsidized in neighboring countries, it will most likely continue. The Ministry has little or no quarantine control at customs posts along the border, and it is difficult to control the illegal commerce of pesticides given the disparities in the region's agricultural support policies. Quality control sampling and a system for commercial registry is not in place but is necessary for the government to be able to establish control over the use and distribution of agricultural chemicals.

Farmers will use any product that works, including unregistered pesticides. Often the products are from Europe and their effects are not known. Nevertheless, there are a series of other issues and problems including: poor labeling and packaging, poor quality control, lack of education programs even though it is mandated by law, lack of application of existing technology that reduces pesticide use, as well as the inefficient regulatory activities mentioned above. (There is some indication that the Callejas government is considering reducing research activities in favor of concentration on regulatory activities.)

Pesticide problems should not be viewed as solely a small farmer problem. For example, cantaloupe production in the Choluteca watershed area is controlled by six large firms. One firm controls 30 percent of production. These firms are currently experiencing a case-book example of pesticide problems. Because of the large, modern, monocultural nature of cantaloupe production and previous intensive use of pesticides, a virus has developed which has caused a collapse of production in areas currently under cultivation. A direct correlation between the application of pesticides and development and increase of the virus has been shown. As a result, these firms are moving their operations to other valleys currently unaffected by the virus. Since their practices will likely not be changing, this sequence will repeat itself. Policies favoring the export of such non-traditional exports will need to be evaluated within this context.

The integrated pest management (IPM) technique does not propose elimination of most pesticides, only their appropriate application with other means of pest control. Credit is difficult to get for non-chemical inputs. For example, manual pesticide control is not considered credit worthy by banks while it may be cost effective from an IPM perspective. Credit availability for the development of biological controls (There are two or three commercial insectories.) could help shift practices away from intensive use of chemicals. As noted previously, a tax on the toxicity of imported pesticides could also improve the situation.

Pesticide use and other methods of intensifying agricultural production

can, arguably, reduce pressure on the agricultural frontier by producing more on less land. While aggregate production may increase, the effects on the agricultural frontier will depend on a number of distributional issues including how the government uses increased revenues and the employment generated by the intensive agricultural activities.

One of the primary controls on the use of pesticides in Honduras has been the regulations and controls in the United States. Where banned pesticides have been discovered in products being imported, including in some instances cattle, those the products have been rejected. For those products destined for export, much more care is generally given to pesticide use, at least in terms of the level of residuals if not the effects on the soil and health.

Production form Natural Forests

Policies which regulate the forestry sector include significant government involvement resulting from ownership issues discussed above but also involvement in production and marketing. International development agency programs and proposed reforestation incentives are also discussed.

Forest Regulations

There are two major components of the forestry legislation in Honduras: Forestry Law 85 (1971)and Forestry Law 103 (1974). During the 10 years from 1974 to 1984, policies and regulations were set administratively and were, therefore, subject to the changes in COHDEFOR administrations. In 1983 Law 199-83 created COHDEFOR's Executive Committee which directs COHDEFOR's marketing activities. On April 9, 1984, the General Forestry Regulation was established by Resolution No.634, joining both forestry laws (and incorporating the Law 199-83's modification)into one regulation. In general, it can be said that the COHDEFOR law (Law 103), although restricting foreign investment in primary and priority industries, and giving COHDEFOR exclusive rights to lumber exports, was more of a development law than a regulatory one. The Forestry Law (FL) 85, however, although having some developmental aspects included, was a regulatory, normative law, that followed some of the general principles and norms of the Spanish tradition. All three laws have had a significant effect on the development of the forestry sub-sector of Honduras.

Article 2 of the General Forestry Regulation (GFR) states that, according to Article 8 of the FL 103, COHDEFOR constitutes the State's forestry administration, such that it applies all the forestry legislation of Honduras. As has been mentioned above, 10 years passed before the forestry laws had regulations implemented. Prior to this regulations were issued by administrative fiat. During that decade there were six COHDEFOR administrations, each one having its own criteria and oftentimes representing different interests. Therefore, from one administration to the next, there could be changes in the "rules of the game," which generated many uncertainties in the private sector.

COHDEFOR has not had program budget or program budget control. The budget is organized by geographical management units and not by programs or activities. The growth in non-technical personnel became a heavy bureaucratic burden, and with inefficient marketing management, and limited income, there was even less

emphasis given to forest management and social forestry issues. As a result, the little control over forest use by application of regulatory norms became even weaker.

The performance of COHDEFOR with respect to some legal mandates is illustrative of its management approach:

1. In terms of land use planning, Articles 24 through 28, under Title IV of the GFR, define the technical parameters to classify lands that have a forestry use capacity and the mechanisms that have to be used to incorporate this concept in the agrarian reform and its forestry activities. This has never been applied.

2. Some aspects stated in the GFR are administratively or politically not viable. For example, Article 36 requires COHDEFOR to maintain the State's possession of public forest lands, preventing any illegal acts of possession and demanding the return of those State forest lands that are in illegal possession of private holders. This has never been enforced.

3. Articles 80 and 81 of the GFR require COHDEFOR to establish a national forest inventory data bank, which shall be the basis for forest management plans. However, the law does not require COHDEFOR to keep it updated, which is the reason the latest inventory information that is presently available, dates from 1983, when the inventory was finished. There has been no subsequent updating during the recent massive deforestation period, making the available 1983 information obsolete.

4. Title V of the GFR deals with forest protection and conservation. There are many regulatory prohibitions and bureaucratic procedures for exceptions to the rules, in cases of fire protection and cattle grazing, forest plagues, and reforestation.

5. Title VI refers to the hydrological regime, establishing the obligation that all irrigation, hydroelectric or potable water development projects must be preceded by a watershed management plan. This has never been implemented. As a matter of example, the El Nispero hydroelectric project (IDB financed), an investment of around $50 million, began operating in 1983 and closed operations in 1988 due to complete siltation and destruction of hydraulic protection infrastructure because of the deterioration of the watershed. There was also a commitment by IDB to fund the El Cajon watershed management plan when the project was initiated. However, this did not occur until 1990.

6. Timber harvesting regulations are included in the GFR Title VII. Numerous studies have documented COHDEFOR's lack of control in harvesting activities. The implementation of a standing timber appraisal system would go a long way to solve some problems. However, this type of system requires advance planning.

The Role of COHDEFOR in Production and Marketing

The 1974 Law Decree No. 103 in Article 7 states that the harvesting, sawmilling and preservation activities shall be done by the COHDEFOR in direct form or through mixed or private capital enterprises. The same article also establishes that, in the case of those forest industries that the President declares as basic for the country's development, COHDEFOR or other analogous entities shall participate in no less than 51% of their capital. Similarly Article 7 empowers COHDEFOR to have the exclusive marketing function of lumber for external markets as well as for wholesale internal markets. Article 184, Title VIII, Chapter 1 and Article 213, Title IX, Chapter 2 of the General Forestry Regulation (Resolution 634, April 9, 1984) confirm these powers. Law Decree No.199-83 of November 22, 1983 created an Executive Committee that incorporates three representatives of the private sector and four from the public sector. This committee is empowered to direct and fix the COHDEFOR's marketing policy.

There were three main ingredients that went into COHDEFOR's decision to become directly involved in lumber production. First, COHDEFOR could be more self-sustaining in lumber exports and less subject to private sawmill owners . Second, there were a number of potential forestry development areas that required relatively large investments and with little or no possibility that private investors would likely be involved. Such were the cases of Yoro, where the FIAFSA sawmill was established (Forestal Industrial Agua Fría, S.A.), and the Olancho forestry development project, CORFINO (Corporacion Industrial Forestal de Olancho) that originally included several sawmills and a pulp and paper complex. Third and last, these industries could become examples of good management, good manufacturing and appropriate harvesting for the rest of the Honduran sawmills. SEMSA (Servicios Madereros S.A.) was created as the lumber exporting firm which bought lumber from the sawmills, classified, reprocessed, packaged and exported this lumber to the different countries/clients that the COHDEFOR Commercial Department handled.

CASISA (Central de Aserrio de Siguatepeque S.A.) was a reprocessing center designed to rationalize the lumber manufacture in an area of highly degraded forests and extremely antiquated circular sawmills. This center would buy rough lumber from the local mills, reprocess it into exportable, quality dimension products and ship directly to port. The value added, plus quality reprocessing made it a more attractive export opportunity for local mills that otherwise would have been limited to local lumber markets. This, however, was never understood by CASISA management, which acted as though the center was another sawmill, competing for the same raw material as the other local mills and paying non-competitive prices for the local mills' rough lumber.

This had two effects: 1) it created animosity against CASISA by the local sawmills who then refused to sell their products to CASISA (even at better prices) and; 2) CASISA was forced to get involved in the primary processing of logs, as a regular sawmill, which more than doubled the timber harvest over the allowable cut for the Siguatepeque Forest Management Unit. This depleted the forest resource at more than twice the rate before the creation of CASISA.

The CORFINO Corporation was created as the development center of the largest virgin pine forest reserve in Latin America. The project design included one main pulp and paper/sawmill complex, located in the northern part of the reserve plus two additional satellite sawmills within the reserve itself. Before the pulp and paper mill decision was taken, the main sawmill was established at a long distance from the forest reserve, resulting in unmanageable transportation costs. The other satellite mills were never established. In addition, the technology for the main sawmill was beyond the needs for the region, inflating the investment costs higher than was financially feasible and making production and maintenance difficult. Poor administration due to political favors complicated matters even further. The GOH considered CORFINO a development priority, thereby justifying other infrastructural investments attributable to CORFINO (main and secondary roads, a seaport and the extension of the electrical grid system, for example) and thus placing an insurmountable financial burden on the company. Forest management was only incipient in the reserve, concessions were given to other sawmills, and poor administration has made CORFINO a continuously losing enterprise. The intention of the new GOH is to privatize this project. However, there is almost $100 million debt associated with the project.

Development Programs in Forestry

Many development agency programs in effect establish policies. About 40% of COHDEFOR's budget is being covered by these programs. They are summarized in Exhibit 4.4. The majority of these investment and development projects are oriented to the pine resource (74%). In addition, the high priority assigned to the Areas of Integrated Management (AMI), is not reflected in the development agencies/COHDEFOR's investment program since it only accounts for a little over 1% of the total investment. Two projects are incentive oriented: the World Food Program, Forestry Development II, and COHAAT's Reforestation Program for the Protection of the Southern Region, account for Lps.12.7 million, equivalent to 10.4% of the total investment. These two projects consist of food-for-work incentives for reforestation, agroforestry and conservation activities for small rural producers.

The first significant effort in natural pine forest management consisted of an IDB-funded/COHDEFOR project for 350,000 ha in the Comayagua Forest District ($13 million, 1981-1985). COHDEFOR had initiated some of these efforts in two management units, and the purpose was to extend the management model over a much larger area. Intensive forest management, fire protection, reforestation, and camp and road infrastructure were some of the main components.

In 1988, a new forest management project was started, with USAID and COHDEFOR funds, to manage the La Union Forest Management Unit of the Olancho Reserve. This project has instituted the standing timber stumpage system and, among its activities, a new stumpage appraisal system is foreseen.

In broadleaf forests, the only development agency that has a forest management project is the Canadian International Development Agency (CIDA). The results, thus far, seem promising, in that the project involves local community participation, agroforestry farming systems, forest management conservation and improvement, and also the revision of the stumpage appraisal system for

hardwoods. ODA also has a technical assistance project for the management of broadleaf forests that will complement development activities of the CIDA/COHDEFOR project.

Incentives for Reforestation

The purpose of this policy is expressed in its legal instrument, the Law Proposal for Incentives for Reforestation and Forest Protection (Reyes, 1989). The intention is that it: a) promote reforestation in soils apt for forests; b) stimulate people's participation in the adequate management of natural resources, mainly in the protection of forests against fire and plague damages and against changes in use that promote an inadequate land use; c) promote wood, energy and multiple use plantations; d) stimulate the population to protect critical watersheds; and e) establish a mechanism to channel internal and external financial resources destined for reforestation and natural forest protection.

The loss of nearly 1.8 million hectares, equivalent to more than one-quarter of the forests of Honduras in the 1964-1986 period (Perfil Ambiental, 1990) makes its deforestation rate the highest in Central America. The following have been cited as some of the major reasons for this: the significant increase in population; the over-installed capacity of the sawmilling industry; the lack of adequate supervision on the part of COHDEFOR; the land tenure system; the lack of a well defined state policy; and the lack of incentives for the conservation of forests. The proposed policy is designed to address the last need.

A Forestry Fund is being proposed in order to provide the funds that will finance reforestation and conservation incentives. This fund will be constituted by: an initial L.2 million provided by the Honduran General Treasury; the sale of reforestation government bonds for up to L.10 million; no less than L.3.50 per cubic meter of softwood stumpage fee and no less than L.10.00 per cubic meter of hardwood stumpage fee, contributed by COHDEFOR; the equivalent amount of 1% of COHDEFOR's revenue derived from lumber exports; the equivalent of 1% of the value of the exports of secondary wood products; donations, inheritances or legacies that COHDEFOR may accept for these purposes; and income derived from loans or other sources for this purpose.

The Fund's resources shall be used for the following purposes: for consulting firms that prepare and evaluate specific projects; for project inputs which shall be offered as incentives; for the fees and commissions originated by the trust fund; for promotions of the program; for credit to the beneficiaries; for expenses in supervision and extension services provided by COHDEFOR related to the program, not to exceed 5% of the total Fund; and other expenses needed by the program, authorized by the National Committee. The credit component of the Fund shall be no less than 30% of its annual income; payback periods, interest rates, guarantees and other loan conditions shall be established in a Credit Regulation approved by the Central Bank. Projects whose total cost do not exceed Lps. 50,000.00 shall be approved by the Regional Executive Committees and those exceeding that amount shall be approved by the National Committee.

Requests from potential beneficiaries may be presented at COHDEFOR's regional offices and will be analyzed by the corresponding Regional Executive Committees and inspections done by COHDEFOR technical personnel, on a first come, first served basis. These requests will be considered qualified if they meet one of the following objectives: protection and management of natural pine forests; prevention of the negative effects of shifting agriculture and extensiv cattle grazing, especially on hillsides of natural broadleaf forests and the buffer zones of protected areas; prevention of the deterioration of forests and soils in watersheds; or the plantation of new forest resources for energy or industrial purposes, be they for domestic consumption or for export.

There this first effort to create incentives for natural forest management, reforestation and conservation can have a positive impact on the production and deterioration of forests, watersheds and protected areas if enacted. Nevertheless, it is important to point out a few issues: 1) it does not take into account management of natural broadleaf forests, since it specifically refers to pine forests(although its Section C is not clear about whether both types of forests can be included in these incentives for forest management); 2) "prevention of negative effects of shifting agriculture" is almost a catch-all category especially when shifting agriculture represents a structural problem; in other words, these incentives will do little or nothing to solve the real problem; 3) "prevention of negative effects of cattle grazing" is another catch-all category that opens the door for "beneficiaries" that don't need any further help. Without placing rigorous definitions on these "preventions," cattle ranching may yet have another advantage and an added incentive in hillside areas of natural broadleaf forests or in the buffer zones of protected areas; 4) contracts will be signed between COHDEFOR and the beneficiaries, and the respective management plan will be a part of the contract. Nevertheless, there is no stipulation as to what the obligations are on the part of the beneficiaries, particularly when a management plan may last for more than one generation, or when an area that has benefitted from these incentives is sold to another person; 5) "campesino" groups are limited only to fuelwood plantations and protection incentives, thereby limiting their access to other potential forest and watershed management activities and benefits.

Management of Critical Watersheds

Sustainable agriculture and forest issues form major components to watershed management issues. However, other problems will be addressed under the rubric of watershed management because of their interdependence within the geographical bounds of watersheds. These issues include hydroelectric power generation and rural electrification, irrigation, coastal land management issues, especially shrimp development, and waste management and water pollution issues.

Hydroelectric Development Issues

Resource degradation in watersheds can have a severe effect on hydroelectric power generation. Poor agricultural practices and deforestation contribute to soil erosion which can through siltation shorten the life of a hydroelectric facility. This is not an abstract issue in Honduras where the El Nispero dam ceased functioning after only a few years of operation because of siltation. However, there is very limited physical information on the actual

level of degradation in the watersheds of Honduras.

One of the most important watershed issues in Honduras is the El Cajon dam, completed in the mid 1980s. El Cajon is one of the ten largest dams in the world and has a capacity of 929 MW. In addition, it provides flood protection for the Sula Valley. It is the principal source of electricity for the country and was developed to provide a source of foreign exchange through export of electricity to neighboring countries. Unfortunately the economic conditions of the region have not allowed this to develop, since foreign exchange is scarce in the purchasing countries.

The environmental issues associated with El Cajon have yet to be fully understood. Clearly, little thought was given to environmental conditions of the watershed such as agricultural practices leading to erosion into the 94 km2 reservoir. The Interamerican Development Bank project is completing an economic feasibility study of an integrated watershed management project for the area (which includes many local government units as well as many different offices within and among government agencies). The USAID LUPE project has extension agents working on watershed management techniques at the farm level. COHDEFOR is trying to establish AMI in the region. An associated problem also arises because of the existence of national parks, forest reserves and wildlife reserves in the region.

There is no agreement among people familiar with the sediment conditions of El Cajon. Arguments vary on the rate of sedimentation and the length of time until sediment affects the economic life of the dam. However, there is enough evidence of increasing land use pressures in the watershed to merit the efforts now beginning. Also there appears to be heightened understanding on the part of the government and international donors that greater care directed to environmental management will be needed before large scale projects are begun.

Coincident with hydroelectric issues in watershed management are issues associated with rural electrification and its benefits and costs vis-a-vis fuelwood use. While electrification efforts until this point in time have primarily focused on urban areas, there has been some interest in implementing the First Plan for Rural Electrification, 1986-1989, funded by the German government. It has been argued that too much effort has gone into urban versus rural electrification. On the other hand, it may be easier and more cost and resource effective to, in the short term, replace urban uses of fuelwood.

Irrigation

According to the USAID/Honduras Agricultural Sector Strategy:

> Much of the currently cropped land could be intensified by the expansion of the irrigation network. It has been estimated that only 15 percent of the land which is potentially suited for irrigation is currently irrigated. Intensification of land use will require additional investment in irrigation infrastructure. Investment in this is constrained partly by the lack of adequate public sector services for developing projects and training farmers, but more importantly, many of the policy constraints mentioned elsewhere discourage such investment. At the same time, no

other single intervention increases productivity of agricultural land more than the development of irrigation systems. (USAID 1990, p,12)

From the quote above it can be seen that a number of themes developed elsewhere in this report are also pertinent to irrigation development. Policies which influence the returns to agriculture affect the willingness of individuals to invest in irrigation development and maintenance. The declining returns to most agricultural commodities will limit irrigation expansion. In addition the fiscal problems of the government limits development of irrigation projects, whether large or small, to donor assisted projects. Major problems associated with recurrent costs result in low maintenance and productivity from existing irrigation projects.

The DRH (Direccion de Recursos Hidricos) has responsibilities for all water resources as well as the administration of the Water Law. Of the 400 thousand to 600 thousand has. which are estimated to have irrigation potential only 67,000 has. are developed. Of this approximately 32,000 has. are private sector banana plantation projects, 8,500 government irrigation districts and the remaining in small or medium sized projects in the private or reform sector. Efficiency in the public systems is estimated to be only 30 percent.

There has been general interest in irrigation as a potential source of production of export crops like cantaloupes and horticultural crops. Many donors such as USAID, Japan and Canada have supported various efforts over time. There has also been activities by other government agencies such as INA. In almost all cases these irrigation activities have quickly deteriorated after donor involvement. There is apparently little political interest in irrigation. While the new National Plan for Irrigation and Drainage proposes an annual increase in irrigated land of 8,500 has.(1,500 has. to be rehabilitated and 7,000 has. of new projects.), only 1,000 are currently projected. Many projects have been studied or designed. Of these the project for the Choluteca River, which has been studied since 1974, presents a good example of some of the potential trade-offs with irrigation development. The project as designed at present will irrigate 24,000 has. This will generate significant employment and export crops. However, this intensification of agriculture in a river which flows into the Golf of Fonseca can have negative effects on a number of downstream users including shrimp farms and mangroves. Pesticides use which would be concomitant with irrigation might damage other water users. Salinization of irrigation projects in the region is already evidenced. This is another example, of the environmental and economic tradeoffs which occur between intensification of land use with pesticide and soil fertility issues and the potential of this intensification leading, in theory, to a reduction in pressure on the agricultural frontier.

There are also issues with respect to the institutional capacity of DRH and other related government units. These institutions lack personnel and most of the budget goes to financing administration and personnel. While they may suffer from a lack of political interest in irrigation projects (because of, perhaps, a short-term time perspective similar to the economic time preferences) represented by, among other things, low capital funds, the institutional ability of DRH to absorb funds seems limited. Thus many economic, institutional and environmental issues arise with irrigation development and watershed management

decisions. Simply focusing on irrigation will result in the replication of the problems noted above.

Mangrove Resources and Shrimp Development

In the last four years, great interest has been generated by national and foreign investors in developing marine aquaculture operations in the Gulf of Fonseca. The area under production has increased from an estimated 2,000 ha. in 1987 to 4,000 ha. in 1988. The concessions are given by the Ministry of Tourism which has the legal control over all coastal areas from the mean high-tide line, up to 2 kms. inland. This encompasses virtually all the land suitable for shrimp-farm operations. A development project is presently envisaged within government agencies and the USAID Mission in Honduras, that is based on a potential site study done by COHDEFOR, and confirmed by TR&D (1988), that identifies 31,000 ha. of potential sites for marine aquaculture operations. This would affect about 50% of the mangrove area in the Gulf. The foreign exchange benefits to Honduras, however, can be significant since 1989 projected value of exports were about $15 million, projected to reach $72 million by 1992, at the current rate of development. If the 31,000 ha. were developed, potential exports would be in the order of about $110 million/year.

The existing process of granting concessions causes undue delays to serious potential investors. Furthermore, there are no written set of rules for applying for a concession. The Ministry of Tourism lacks the basic policies, trained personnel and equipment needed to streamline and rationalize the process of granting concessions. Concessions are being granted without knowledge of the competence of the applicant, the suitability of the site, or whether the area requested overlaps with previously granted concessions. Another policy issue is the 15 year length of the concessions, recommending that 25 years would be a more appropriate period. Furthermore, there is uncertainty created by RENARE's restrictions on post-larval collection, that is being felt through the industry.

With appropriate siting and management, the shrimp industry can be sustainable without deteriorating the mangrove environment. However, there are a number of indications, such as the lack of human resource capacity that can cause considerable concern:

1. Presently, the effective blocking of tidal waters caused by the shrimp industry's location and water mismanagement, that often intercepts the flow of tidal channels, is causing mortality in the neighboring mangrove stands;

2. Post-larval harvesting is being contracted to local fishermen who use nets that collect all other species, such as crustaceans, fish, etc., thereby wastefully depleting important species that have provided the livelihood for generations of local artisan fishing communities of the area;

3. The blocked access to artisan fishermen to traditional fishing areas is another source of conflict.

Other users also clearly affect the use of mangroves. These include fuelwood, salt ponds and fishermen. The interaction of these resource users and other potential developments as affected by the policy regime is an important and high priority for analysis.

Given the importance of the resources in the Gulf of Fonseca, a brief description of the tenurial issues particular to that situation is given here. Before 1980, when SECTUR was given responsibility for coastal resource decisions related to tourism potential, many other institutional requirements overlapped and prevented effective decision making regarding resource use. These institutions retain these powers but a unified administrative procedure has been developed. This procedure includes not only SECTUR but also RENARE as it administers the fisheries law (which prohibits cutting of any mangroves), COHDEFOR as it administers national forests and INA as it deals with land use and tenure. These institutions are represented in a 26 step procedure which determines the award of concessions. The procedure takes 11 to 14 months. When approved the Solicitor General signs a 20 year lease for 4 Lps. per hectare per year. These procedures are under criticism for the length of time taken to get approval, often of shrimp farms with high foreign exchange potential. It is also criticized because of the lack of technical skills needed to adequately understand the resource use issues in SECTUR as well as the other institutions. There are also questions of effective control of other activities in the region, including destruction of mangroves by those needing fuelwood. An attempt by SECTUR to establish an Interinstitutional Mangrove Commission in 1985 met with no success. From the point of view of wildlands management these institutional and tenurial problems are not atypical.

Water Pollution and Waste Management Policies

Title III of the Sanitation Code deals exclusively with environmental sanitation, establishing that all rural and urban populations should have an adequate sanitation system for disposing of human wastes and waste waters. It also charges the municipal governments with the responsibility of cleaning, collecting, treating and disposing of garbage in a sanitary manner. The Code prohibits the elimination of industrial wastes into the sewer system without permission from the General Department of Health in the Ministry of Health. It also prohibits the discharge of sewage, runoff and industrial wastes into lakes, lagoons, rivers, estuaries or other water resources that serve as sources for drinking or irrigation waters. In relation to air pollution, the Code states that the General Department of Health should take any necessary measures to protect the population from health risks associated with toxic gases, smoke, dust or other harmful substances discharged into the air.

The Regulatory Act that details the mechanisms to apply the Sanitation Code prohibits the direct discharge of all wastes into any water source, despite its destination, without previous authority from the Ministry of Health. Article 6 also prohibits the discharge of all garbage, sawmill and other industrial wastes along the banks or shores of rivers, streams, lakes, lagoons and other water courses without previous authorization from the General Direction of Public Health. According to the Regulatory Act, in all communities where a sewer system exists, all homes and other buildings should be connected so as to remove human wastes and waste waters. Article 15 states that the General Department of Public

Health should determine the type of sanitary treatment required by domestic and industrial wastes in order that they be discharged into the public sewer system.

In general terms, both the Sanitary Code and the Regulatory Act charge the municipalities with the management of municipal garbage but exempts the municipalities from handling industrial process wastes or other complex waste products produced by workshops, repair shops or factories. The Regulatory Act suggests that the Municipal governments can request technical assistance from the Division of Environmental Sanitation of the General Department of Public Health pertinent to waste collection and disposition matters.

The Regulatory Act prohibits the installation of industries or factories inside urban areas that produce gases, smoke, dusts and other damaging emissions for human health. It also requires that all motor vehicles maintain adequate combustion in order to avoid the emission of harmful gases and charges the General Department of Transit (Ministry of Defense and Security) with the legal responsibility.

The Law that creates the National Autonomous Water and Sewer Service (SANAA) is based on several considerations, including the in ability of Municipal governments, either technically and financially, to develop a potable drinking water system or adequate sewer and drainage systems. The law created a centralized authority to develop the drinking water distribution system in communities throughout the country. SANAA basically acquires through this law all the responsibility for determining how, where and when to develop water and sewer systems. Of course, it also has the responsibility of maintaining these systems. This law also charges SANAA with the responsibility to be vigilant of the existing forestry conservation laws and for the maintenance of sanitary conditions in the watersheds where systems have been or will be developed.

The Fisheries Law of 1959 prohibits any noxious waste discharges into streams, rivers, lakes, lagoons, the ocean or any other water course, that causes damage to the habitat of the resident flora and fauna. The penalty applied to polluters charged with violating the Fisheries Law is 300 Lps..

The Police Law and the Penal Code, which are executed by the Municipal police authority as well as the Ministry of Defense and Security, allows for the use of police powers to support the official sanitation policy. Article 311 of the Police Law prohibits bathing in waters which are used for human consumption with a fine of up to five Lps. Article 312 charges the police authorities or inspectors with maintaining clean drinking water sources. Article 313 prohibits the discharge of dangerous substances into drinking water sources with a fine of up to five Lempiras. The Penal Code allows for imprisonment of from three to six years for anyone responsible for the contamination or poisoning of water, food and medicines, and specifically mentions chemical and mining wastes that affect the "ecological equilibrium."

The Ministry of Health has given blanket approval for any waste management practices. It is impossible to determine who has obtained authorization because the General Department of Public Health has not maintained a registry of permits. Some Ministry of Health officials recognize that they have no capability to enforce the sanitation policy. Since the Ministry's main financial support for

programs and projects comes from international donors or lenders, their staff is involved in the management of these programs, which as stated earlier, are focused on the development of drinking water projects.

The draft Sanitation Code submitted to congress has a slightly advanced approach to the policy of sanitation and waste management, but it still charges the General Department of Health with determining permits. According to Ministry personnel familiar with recent history of the same institution, if a home builder, industry or Municipal authority requests authorization and the General Director has no firm decision made, he will request opinions from the Heads of pertinent Divisions. These opinions may or may not be taken under consideration. In all known cases, the Ministry has made no effort in the waste discharge permits it grants to control or provide guidelines in the treatment of waste or improvements to existing systems. The Ministry has neither requested nor demanded changes in the waste permit system in order that pollution be mitigated or discontinued.

In the case of the Mochito mining operations in the northwest sector of the Lake Yojoa watershed managed currently by the American Pacific Mining Company, since 1972 the mine's solid and liquid wastes are disposed of in large settling ponds. The condition of the retaining walls of the lagoons has been unsatisfactory and in heavy rains there have been spills of wastes into local streams, many of which drain into Lake Yojoa. Both the streams and Lake Yojoa provide drinking or irrigation water to rural families downstream or along the lake shore. A significant percentage of the population in this area have blood lead levels above the recommended minimum of the World Health Organization.

Claiming imminent bankruptcy the Rosario Mining Company , which had operated the Mochito Mines since 1947, withdrew in 1986, leaving thousands of residents of the Lake Yojoa watershed unemployed. This became a great political concern of the congressmen from this region who became active in the search for solutions to the socio-economic problems created by the company's withdrawal. The American Pacific Mining Company eventually bought the mine. This transaction was aided by a debt-for-equity swap. However, significant economic concessions had to be worked out with the company in order to make their investment attractive. These concessions consisted of significant economic changes to the Mining Code that substantially reduced the land concession fees, sales taxes and other fees established previously for other mining companies. These concessions have made it very attractive for the American Pacific to continue mineral exploitation and exploration and provide employment to approximately 1000 workers. The contract which was agreed upon by the Company and the Ministry of Natural Resources through the General Department of Mines and Hydrocarbons indicates the responsibilities of the two parties. While consideration of contamination problems are covered in the contract with fines of up to 10,000 Lps. for the company if it is proven that they discard toxic or poisonous substances into the water resources, no specific consideration is given as to how the land which is exploited under the concessions' terms will be left after the exploitation or exploration is finished. If the General Department of Mines and Hydrocarbons does not dictate specific means for environmental protection, the topic is not considered. The General Department of Renewable Natural Resources has the power to demand such protection measures, but they must be specific and must be capable of enforcement. Thus far this has not been the case. The

Fisheries Law has given the Ministry the power to fine up to 300 Lps. when habitat contamination is proven. This fine has been paid by the Rosario Mining Company the few times that they were fined. The small size of the fine provides no real economic incentive to mitigate or eliminate environmental contamination.

Wildlands and Biodiversity

Overview

The extinction of wildlife species carries with it costs that are difficult to enumerate or estimate but which nonetheless are real. An ecosystem's resilience to natural catastrophes is largely due to its complexity. In a very much simplified ecosystem such as modern agriculture presents, with extensive plantings of a single crop and most competing vegetation eradicated, population outbreaks of a pest are more explosive and are poorly controlled by a concomitant increase in their natural predators because the necessary habitat for predators is missing. By analogy, biologists fear that wholesale extinctions of species in the global ecosystem may reduce below some critical level the degree of complexity that buffers change and ensures resiliency.

Extinctions are not the only way in which the living resources of the planet are diminished. Every species is itself complex and heterogeneous in its genetic composition. It is this genetic variety, present in every species, that has allowed modern agriculture to develop so many different and numerous strains and races of crops and livestock. The interdependencies between wildlife ecology, agriculture and economic pressures are complex. They present a set of interactions that is subject to no facile or certain explanation and no easy prescription.

Wildlife is defined as living things that are neither human nor domesticated, especially mammals, birds and fish but also including flora. Wildlife species have many kinds of habitat needs. Resident species have differing needs from migratory species. Each species may have different space and territorial needs. While wildlife communities are dynamic and changing, some species can adapt to change easily while others become extinct. A relatively small change in water or soil temperature, for example, could affect the food system in a local ecosystem and change at least the variety of local species.

Maintaining biological diversity in a wildlife context can be viewed from three perspectives: (1) the preservation of individual species, (2) the preservation of ecosystems, and (3) the preservation of genetic diversity within species. The chances that species, ecosystems, or individuals will survive future environmental changes increase when the number of species, the variety of ecosystems, and the amount of genetic diversity increases. Each species is a unique evolutionary solution to the problem of surviving in a given environment. Everything else being equal, smaller species populations result in a diminished ability to adapt to environmental change. Maintaining greater variety reduces the risk of losing important genetic information and increases the chance that populations will contain the favorable genetic types able to exploit unusual environmental changes. In addition to the implicit and explicit monetary values associated with wildland and biodiversity protection, nonmonetary values such as education, aesthetics and psychological and philosophical values are also

concerned. (Johnston, 1984)

These values are difficult to capture within market transactions. Indeed, within the Honduran context, pressures on wildlands and biodiversity are often driven by immediate human and market needs. Values accruing to others, especially future generations, are not reflected in the actions of current users because of the subsistence nature of their lives or the short time frame and emphasis on trade versus production in economic activity in Honduras.

National Parks and Reserves

This section will focus primarily on the national parks and protected areas. It will begin with a review of pertinent legislation and management issues. Some of the other analytic themes developed in other sections of this report will be discussed in the context of problems faced by managing some of the parks and reserve as examples.

Many laws discussed above have effects on wildlands and biodiversity. These are briefly listed below along with the primary pieces of legislation applicable to national parks and protected areas. This list was developed by AHE and presented in the First Meeting on the Management of Wildlands in Honduras, January 30, to February 3, 1989 (AHE, 1989).

1. Forestry Law, Decree No. 85, 1972. Definition, classification, and administration rules for forest areas.

2. Law of COHDEFOR, Decree No. 103, 1974. Assure the protection, use and improvement of forests.

3. Water Law, 1927. Protection, conservation and use of water.

4. Law of Natural Resource Use, Decree No. 921, 1980.

5. Law for the Protection of National Cultural Patrimony, 1984.

6. Law for the Declaration, Planning and Development of Tourist Interest Zones, Decree No. 968, 1980.

7. Fisheries Law, Decree No. 154.

8. Organic Decree for the Natural Resources Secretariat.

9. Creation of the Executive Committee of COHDEFOR, Decree No. 199, 1983.

10. Establishment of the Forestry Zone of Cusuco, Decree No. 210, 1985.

11. Legislative Decree No. 53(and 210-85). 1959. Declared the Forest Reserve of Cusuco mountain (covering different areas).

12. Legislative Decree No. 38, 1961. Creation of the Forestry Reserve for the Rio Pelo Watershed.

13. Legislative Decree No. 49, 1961. Creation of the Forest Reserve for Guanaja Island.

14. Law Decree No. 117, 1961. Created a Protected Forest Zone for Mangroves in the Gulf of Fonseca.

15. Legislative Decree No. 71, 1971. Created the Protected Zone for the Tributary Watershed for Lake Yojoa.

16. Law Decree No. 72, 1971. Created the Forest Reserve of La Tigra.

17. Law Decree No. 977, 1980. Created the Biosphere Reserve of Rio Platano.

18. Law Decree No. 987, 1987. Created the National Wildlife Refuge of Cuero and Salado.

19. Law Decree No. 87, 1987. Created Cloud Forest Park System including 29 wildlife areas.

20. Pesticide Law, 1981

21. Law of Plant Protection, 1962

22. Mining Code, 1964.

23. Law establishing SECPLAN, 1986.

24. Law establishing IHCAFE, 1970.

25. Agrarian Reform Law, Decree No. 170, 1984.

Many of these laws have been discussed elsewhere in this report. This section will focus on the policies which address the establishment and management of national parks and reserves. Some of the more important legal issues were summarized by Ing. Arnulfo Cruz of COHDEFOR as follows;

1. There are contradictions among many of the laws, for example, the Forestry Law and the law establishing cloud forest reserves.

2. There are inconsistencies between of some wildland areas and the purpose of their creation.

3. Some areas lack legal instruments for their management, for example, Lancetilla, Punta Sal and the corral reefs of the Bay Islands.

4. In the definition, classification and declaration of the majority of wildland areas, legal and administrative procedures were not followed.

5. In the management of declared wildlands legal procedures were not followed in their delimitation, demarcation and administration.

6. There is duplication of responsibilities between COHDEFOR, RENARE and SECTUR in the administration of wildlands and maritime resources, especially in the Gulf of Fonseca.

7. There is a need for a single law to address wildlands instead of the many pieces of legislation which currently exist.

8. The majority of the laws which have officially declared wildlands have no implementing regulations.

With respect to the last point, there in almost no management of the majority of the park and reserve system. There are officially 51 protected areas and another 41 areas are proposed. Only five parks or reserves have a management plan and any significant management presence. These include: La Tigra (Which is the best managed but not without problems of agricultural incursions from coffee growers.), the Rio Platano Biosphere Reserve, the Gulf of Fonseca Protected Mangrove Forest, the Lake Yojoa Protected Forest Zone and the Wildlife refuge of Cuero y Salado (manatee). Fourteen other areas have some public or private institutional presence. All of these areas are managed less than their particular situations require.

The AHE will soon be publishing a review of the state of knowledge on many issues associated with individual parks. A few of the policy relevant issues will be summarized here for some of the more important or typical park situations.

- Lake Yojoa was declared a protected forest zone in 1971. However, very few results seem to have been forthcoming. Many institutions have overlapping authority, including SRN, COHDEFOR and INA. Indeed, INA has established settlements within the watershed. One estimate indicates that 80 percent of the watersheds feeding Lake Yojoa have some soil management problems resulting from agricultural activities and deforestation. In addition, there have been studies documenting heavy metal pollution from mining activities.

- La Tigra National Park was created in 1980. Institutions with some responsibilities include RENARE, AHE, SANAA. COHDEFOR, and SECTUR. There are 12 RENARE staff with the park as well as two from AHE. This park is near Tegucigalpa and is an important source of water for the capital. There are an estimated 8808 tourists annually. There is some agricultural pressure from coffee and basic grain farmers. There is also wood cutting for fuelwood. Buffer zone issues need to be addressed.

- Gulf of Fonseca issues were addressed in part when discussing coastal land concessions. Numerous pieces of legislation have declared mangroves areas protected (Mangrove Forest Protected Area. 1958) and destruction of mangroves prohibited (Fisheries Law, 1959), among others. Complementary activities include sport fishing and dove hunting. Activities which put pressure on the resource include agriculture, often large scale; cattle ranching; shrimp farms; salt extraction; hide curing; fuelwood and charcoal production, and;

fishing. Shrimp and fishing depend directly on mangroves in producing the natural inputs into their operations. Indeed, post larvae shrimp used as base stock for shrimp farms were very scarce in 1989 and had to be imported. This was caused by over harvest, diminishing resource base and exports (which were banned by President Callejas in early 1990.) Given other resource management issues in the watershed which feed the area in Honduras and the interdependence with resource management in the El Salvador and Nicaragua sections of the Gulf of Fonseca, some priority will need to be given to addressing the important economic and ecological issues of the region. Issues raised by CODDEFFAGOLF suggest that there will need to be clear separation of vested interests from the decisions taken. The losses from not acting may well be irreversible.

- The Rio Platano Biosphere reserve on the north coast of Honduras was created in 1980. Twelve people staff the reserve. A wide array of wildlife is present and one estimate suggests that a significant number of the species in Honduras are represented in this area. This relatively large area has substantial problems including a through road, 8 INA settlements and introduction of coffee by IHCAFE to some of the settlements in the reserve. Activities in the reserve include relatively stable and established settlements in the north to migratory agriculture in the south. Approximately 95 percent of the land in technically in public ownership. The population in and about the reserve is approximately 13,450 people. This includes some indigenous populations of Pech and Misquitos. There is a management plan partially funded by USAID through AHE but lack of coordination remains a problem. Issues of settlements in and near the reserve are unaddressed.

The examples given above represent park and reserves where some management activity have taken place. With a few exceptions most of the other 52 parks and reserves exist little more than on paper.

The potential for nature tourism has not been serious explored by either the public or private sector. Tourism to the Copan archeological site, dove hunting and some interest in developing La Tigra and the Bay Islands represents the extent of current interest and discussion. Development of this potential is some time in the future.

Wildlands represent a good example of the short-term and long-term decisions inherent in many resource issues. While there are some, often non-monetary benefits to the present generation, it is the future generations which will benefit significantly from the preservation of these areas. McNeely (1988) neatly lists the benefits of protecting habitats:

1. Stabilizing hydrological functions;

2. Protecting soils;

3. Contributing to stability of climate;

4. Conserving renewable harvestable resources;

5. Protecting genetic resources;

6. Preserving breeding stocks, population reservoirs and biological diversity;

7. Maintaining the natural balance of the environment;

8. Supporting tourism and recreation;

9. Creating employment opportunities;

10. Providing facilities for research, education and monitoring.

However, these benefits are often gained at the expense of those least able to afford the concomitant costs. The land tenure issues and the distribution of wealth and equity issues as well as increasing returns to agriculture through macroeconomic changes, access to credit, land taxes and land banks will be as or more important than the issues raised above. Those issues include increased administrative capacity, improved budget allocations, clear and likely unified legal instruments for management and political will to address current problems such as settlements within parks and reserves.

Regulatory and Sectoral Policy Findings and Issues

Sustainable Agriculture

- Attempts by the government through IHMA to control basic grain imports and manipulate market prices have by and large failed to influence prices. Some downward pressure has been placed on rice but most of the price effects are captured by intermediaries and does not reach the producer. The results are ineffective government activities and no increase in the returns to agricultural production. Recent and anticipated policy changes should improve the situation.

- Basic grain regulations have been changes to encourage production. This has also included elimination of the potential for expropriation of lands cultivated to basic grains. Results thus far are not conclusive. The approach taken is to increase productivity and not expand production.

- The government has had retail price controls which have not been effective and has primarily benefitted the urban middle class. This has contributed to the set of policies which have contributed to lower returns to agriculture.

- The government has also operated a chain of food stores which have contributed to the effects noted above as well as been a costly and inefficient drain on government funds.

- Credit is provided primarily to large producers at subsidized rates for short-term loans. BANADESA has large arrears from the public sector loans (including the reform sector) as well as the private sector loans. This has contributed to a lack of credit for adoption of technology to increase productivity.

- Control mechanisms for pesticide import and use is ineffective. Significant localized health and production problems exist. Institutional capacity is weak. While some IPM technology exists its adoption is hampered by preferences given to chemical inputs by credit institutions.

Production from Natural Forests

- COHDEFOR has concentrated its efforts on timber production and marketing and has not directed effort or resources to the management of forests. Its institutional capacity in this area is weak. It has no effective control of forest activities.

- Development activities with forests product cooperatives and AMI have not been adequately supported. At times these activities have conflicted with timber concessions known as Tributory Areas.

- Activities in production and marketing through parastatals has been unsuccessful and many of these activities have been or are in the process of being sold to the private sector.

- The timber industry in Honduras is highly concentrated and oligopolistic. Timber has not been managed for sustained use but is instead mined. While slash-and-burn activities has been a principal source of deforestation, timber mining as also been important.

- The legal ownership of all timber resources by the government through COHDEFOR has not been effective on resource use. This has resulted in a de facto open access resource where the incentives of resource users is to use the resource as quickly as possible before others get to the resource.

- There is very little reforestation activities by the government or by the private sector; the exceptions being donor supported projects.

Management of Critical Watersheds

- Development of hydroelectric power has until recently ignored watershed management issues of soil erosion and sedimentation. Problems of reduction in the economic life of projects has been evidenced in some projects.

- Many institutions have responsibilities which influence watersheds. Many conflicts are evidenced. For example, INA has established settlements in areas designated as parks or reserves.

- Lack of incentives for long-term investments has inhibited the development of irrigation. Existing public projects has deteriorated because of an inability to cover recurrent costs.

- A large irrigation project in the Choluteca valley could well represent trade-offs between increase short-term employment from foreign exchange generating crops and down stream effects of pesticide run-off in the Gulf of Fonseca as well as soil salinization already evidenced in the region.

- The Gulf of Fonseca has a complex set of resource management issues involving the interdependence of mangrove forests, shrimp farm development, artisanal fisheries, salt production and fuelwood collection, among others. The institutional situation is also complex and results in a process which does not adequately address natural resource and environmental issues.

- Urban, industrial and mining discharges while legally restricted or prohibited are not effectively controlled by either central or municipal governments. Existing penalties or either not applied or too small to change behavior.

Protection of Wildlands and Biodiversity

- The national park and reserve system is ad hoc and has not been in response to any explicit conservation or preservation criteria.

- Most of the parks and reserves exist only on paper. Management, where it exists, is insufficient. Parks and reserves are attempts at changing tenurial systems but have not been effectively managed. This, as is the case with forests, results in a de facto open access resource.

- Many institutional conflicts exist. In particular, the settlement policies of INA have resulted in incursions into national parks and reserves. Other activities by COHDEFOR have similarly ignored park boundaries.

- Many of the resources in such reserves are believed to be endangered and further losses will likely prove to be irreversible. Those losses could impede long-term economic development arising from, among other things, ecotourism.

- Trade in wildlife and incursions into national parks and reserves result from and reflect population growth, tenure systems and policies which have been biased against the agricultural sector.

4.8 Development and Environmental Programs and Strategies

Development Programs

This section will review the attempts by the government of Honduras to establish mechanisms to address both development and environmental objectives. Many technical assistance projects have elements which include environmental activities. These are summarized in Exhibit 4.5. The wide variety of activities funded respond to widely disparate needs but do not correspond to a national strategy to deal with resource depletion and environmental degredation.

The Planning Law

The government planning policy is contained solely in the Planning Law of 1986 which establishes it as a instrument to be used to organize and better execute the economic and social development of the country. This law regulates the planning process, determining the representative participation of the parties involved in the nation's development.

Article 2 of the Planning Law indicates that it will try to guarantee the organized development of the country through a rational use of its resources, raise the standard of living of the population through an equitable distribution of income, guarantee the social well-being of the population through the creation of jobs and the extension of social services, and strengthen the agrarian reform process by guaranteeing social justice in the rural areas and raising productivity in the agricultural sector. The law proposes to do this through the execution of a modern planning process. The law establishes the Ministry of Planning, Coordination and Budget, the National System of Planning and the National Planning Council. The law also establishes the functions of each of the following in order that they contribute to an orderly national planning process:

a) The President;
b) The President in the Council of Ministers;
c) The Superior Economic Planning Council;
d) The National Planning Council;
e) The Ministry of Planning, Coordination and Budget;
f) The Regional, Department and Municipal Planning Units;
g) The Sector Planning Units;
h) The Institutional Planning Units.

The National System of Planning is to supply SECPLAN with all the information it needs to be able to prepare a four year National Development Plan, which must be presented to Congress for approval and which should also serve to determine the distribution of the national budget according to needs detected in the Plan. There are several difficulties with this ideal system, the most important being political considerations. The National Development Plan of 1986-1990 was never approved by Congress but was considered the source for comprehensive sector policy guidelines by SECPLAN. Since the Plan was never approved, it was never published and thus never was officially circulated within the government.

While there have been problems in installing the planning process that the

the law was passed. Related in particular to natural resources management, the General Department of Territorial Planning and the Agriculture Sector Office have been the most active, and have developed significant capabilities that should contribute in the long run to better management practices.

While significant technical capability is being developed in SECPLAN to support the planning process, the most significant deterrent to its success is the poor time management and planning skills of most government personnel. Throughout the public sector, employees are either overworked, underworked, overpaid or underpaid. Some offices are understaffed while others are overstaffed with some unqualified people. Working conditions in the public sector, in almost every institution, are poor for the great majority of workers, with very little privacy that would support a higher productivity within the sector. The Regional and Municipal Planning Units would be more effective if they had better staff and adequate resources to support coordination of activities.

Master Roadway Plan

The Plan Maestro Vial (PMV) (Master Roadway Plan) for Honduras was prepared by the Department of Sectorial Planning in the Ministry of Communications, Public Works and Transportation (SECOPT) under contract with Tecniservices - CINSA. Through congressional approval Acuerdo No. 118[1] became official on December 21, 1988. The contract was financed by the Fondo Hondureno de Pre-Inversion (FOHPREI) with funds provided by the Interamerican Development Bank.

The PMV consists of a series of extensive studies on factors relating to roadway development planning, construction and maintenance, with emphasis on planning in order to contribute to the orderly economic growth of Honduras. The PMV provides the SECOPT authorities with the guidelines necessary to make decisions about where and how to build, improve and maintain roads in the near and distant future.

The Department of Sectorial Planning was created in September of 1986 and given responsibility for the execution of the master roadway plan (PMV) for the country. The preparation of this master roadway plan has required the design of the terms of reference for the study to be conducted on which the plan would be created, selection of contractor from pre-qualified bids, execution of the study as well as its recent publication (1989). At present the nine volumes of the PMV are under review by the authorities of SECOPT as well as in SECPLAN. A political determination will be required to put the PMV into effect.

At present, there is a growing concern in SECOPT for the sociological and ecological impacts of rural roads. In fact, an Office of Rural Roads was created, in part, to respond to the needs for more careful consideration of such impacts during the planning stages. However, it is not clear that such considerations are having a mitigating effect as road penetration into wild areas has not stopped and real capability to conduct environmental impact assessments does not yet exist, despite encouragement from the Interamerican Development Bank as well as the Central American Bank for Economic Integration.

If the PMV is not officially adopted by the GOH, the recent policies of

roadway development, construction and maintenance can be expected to continue. These policies generally respond to political promises of elected officials, pressure from organized communities and groups, a crisis situation (landslide or flood) or military plans.

A case in point is the road that was built in the Valle de Bajo Aguan, particularly important for the transportation of agricultural produce for export and national markets. Even though significant portions were built on flat land in the valley, it was built in such a way as to form a dike when the Aguan River overflows, therefore prolonging flood conditions in the valley. Part of the problem is that no one in SECOPT considered the fact that the heavy deforestation in the area was inducing substantial erosion of soils which are now impeding the hydraulic capacity. Even light rains can mean flooding conditions.

The PMV has incorporated environmental criteria into the roadway planning and design stages of projects, which will ensure that negative impacts are addressed at the planning stages. Every roadway project requires sectorial analyses to be conducted in the planning stages for which the following data must be developed:

1. geomorphologic characteristics of areas near project site;

2. geological characterization of lands near site;

3. biological characteristics of ecosystems to be affected by project;

4. socio-economic characteristics of inhabited areas within the area of influence of the project;

5. maps of areas at risk within the area of influence of the project (for floods, earthquakes, etc.);

6. descriptive maps of anthropological actions most relevant within the area of influence of the project, including such features as illegal human settlements, soil erosion, deforestation, waste disposal (municipal and industrial,etc.), areas under construction, delimitation of urbanized areas and parks, industrial and agricultural areas;

7. data on the beneficiaries of the project;

8. data on the transportation movement of hazardous substances on nearby roads (area of influence);

9. localization of sites of historical or cultural interest;

10. bibliographical data.

So as SECOPT develops its capability to apply the PMV, road design should become more environmentally sound. However, the PMV would be a better instrument to achieve environmental quality if environmental impact assessments were made

a requirement for roads and road improvement projects rather than for new roads only. The PMV does not establish rules for the design, planning, construction and maintenance of roads. At present, the PMV presents guidelines to SECOPT for the future planning of the road system.

Municipal Development Policies and Decentralization

The Municipal Law and Political Regimen of 1927 defines the Municipalities' legal authorities. It charges the municipalities with the government, direction and administration of the public interests and regulates the organization of such services as the police, sanitation services, education, community enhancement, etc. It also gives the municipalities the right to propose taxes, for which congressional approval must be obtained. The Law assigns the municipalities the administration and equitable distribution of community lands, the exploitation of natural resources such as limestone pits, wood and other construction materials, the distribution of water and the regulation of public services.

While this law is still in effect, a number of political decisions have been taken in recent decades that have changed significantly the real status of this law to the point that a new Municipal Law has been introduced into congress. The creation of SANAA, INA, COHDEFOR, FUSEP and ENEE as well as the centralization of road building services in SECOPT have had a debilitating effect on the municipal governments. The distribution of water is the responsibility of SANAA, the forests essentially belonged to COHDEFOR upon the enactment of the Forestry Law in 1974, new roads had to be designed and constructed by SECOPT, INA became responsible for distributing land, the municipal police authority was very nearly replaced by the FUSEP, school teachers were posted by the centralized authority and were not selected from among members of the community, etc.

As a result of these policies any development of human resources in the municipalities has been seriously restricted, particularly at the rural level. Important to note is the fact that the municipalities must submit all taxes and fees collected into the central government treasury, from which they are then supplied with a budget according to the central government's political interests rather than local need. Therefore, the municipalities' resources were being absorbed centrally, rather than locally.

All municipal lands are undervalued and the local government has little or no capability to reevaluate tax rates for properties. This leads to an inability to obtain funds for projects. Except for Tegucigalpa and San Pedro Sula, most municipal governments do not have cadastre services as this capability is centralized in the General Department of Cadastre Services (CATASTRO) in SECPLAN.

The central government has become sensitive to the problems of the municipal governments because rural to urban migration has reached crisis proportions, severely impacting the quality of life in urban areas. Political leaders have come to recognize the importance of supporting rural community development as the means to a better distribution of the human population by curtailing the internal migration patterns towards the urbanized areas.

The proposed Municipal Law will enable the local governments to develop autonomy by establishing control over public services and fiscal affairs. They

will be charged with managing their own budget according to income from taxes collected and other local fees. This will encourage a reevaluation of property taxes and user fees. It should require more control over human resources, as municipal employees' salaries will have to be adjusted according to new responsibilities and relative productivity.

In general, the policy of centralizing public services has substantially weakened the local municipal governments of Honduras to the point where the constituents do not take local government into account when a community need arises. This is especially the case in municipalities with low population density, which do not have much impact in the central government decision making process regarding their budget or any projects that they might need. According to a recent USAID/RHUDO study of the municipalities, there are a number of common problems that should be addressed in any process that attempts to restore local autonomy over resources and services:

1. a scarcity of drinking water;
2. mismanagement of municipal wastes (including trash, sewage, etc.);
3. inadequate maintenance of public properties;
4. deforestation;
5. housing deficits;
6. inadequate sewage systems and maintenance;
7. few significant improvements to local school system;
8. municipal government dependency on the central government;
9. no project planning skills among municipal technical personnel;
10. large bank deficits on loans to past municipal governments;
11. constituency distrust and frustration with local officials;
12. no explicit environmental policies beyond crisis management for water;
13. low government work force productivity;
14. high illiteracy rates, particularly among rural constituencies;
15. malnutrition in young children;
16. fertile land distribution favors major landowners;
17. undervalued land.

As municipal autonomy develops, only the stronger, more prosperous governments will be able to address these important issues and only if they have the technical assistance.

Environmental Programs

Environmental Conflict Prevention and Management

While official, over-all government policies dealing directly with the prevention and management of environmental conflicts do not yet exist, elements important to the development of such policies are taking form. Three such elements are:

1. A proposed legal instrument that would lead to the creation of an environmental authority to which all conflicts between sectors would be studied for resolution. The proposed instrument is the General Environment Law, which was prepared by SECPLAN and presented to congress in the last legislature. The possible environmental authority would probably be developed from the Office of the President, which has already retained an environmental advisor. Otherwise, it will be developed in the Ministry of Natural Resources.

2. A slow but growing interest and capability to carry out environmental impact assessments for development projects. A list of development projects with environmental components appears at the end of this chapter. This activity is being encouraged by donor agencies such as AID, the CABEI and the IDB.

3 A slow but growing capability to monitor the quality of the environment, particularly certain elements. This activity is being encouraged by the Panamerican Health Organization and the Swiss Cooperation for Development, which are supporting CESCCO in the Ministry of Public Health. In addition, the Organization of the American States is providing support to the Limnology Laboratory at the UNAH.

The proposed General Environmental Law defines what the environment is and what its defense means (pollution control, forest and park protection, resource planning, etc.). This law could easily be extensive in size due to its broad scope. However, the law is proposed in such a way as to avoid as much as possible attention to details which should be done through reforms to existing laws (e.g. the Plant Health Law of the Sanitation Code) or through regulatory acts. Nonetheless, it does include judicial techniques to the point that sanctions would be imposed for ecological crimes to the nation. The law would create an administrative entity called the Coordinating Commission for Environmental Policy that would be administered by SECPLAN. It also establishes the use of environmental impact assessments to be used as project planning instruments that can reveal the needs for mitigation measures in any given situation. The law emphasizes the need to develop and support a scientific capability to monitor environmental quality in order to ensure public heath and the integrity of critical ecosystems.

The law suggests that each government institution develop a minimal capability in environmental impact assessments. Probably more important is the development of this analytical capability among government offices that must execute or supervise projects (SECOPT for road building; SANAA for water and waste management projects; SECTUR for tourist projects; etc.). Some training in this area has taken place, albeit rather superficially. In 1988, the AID Health Sector II program with the Ministry of Health and SANAA conducted a workshop on environmental impact assessment methodology for the new mosquito vector control effort to be undertaken using Bacillus thurengensis israelensis to complement and reduce dependency on the chemical pesticide vector control strategy. The CABEI has also conducted some courses for government personnel regarding environmental impact assessment methodology and how to prepare or analyze the environmental feasibility of projects.

Should the proposed law be adopted and its implementation process begins during the Callejas administration, several positive assumptions can be made:

1. support will exist for the preparation of proposals to train personnel in environmental management techniques;

2. proposals will be developed to expand and improve the management of parks and other recreation areas;

3. proposals will be developed to create waste management programs at the municipal level as well as the industrial level (e.g. recycling of industrial wastes);

4. industries will have to change industrial processes or adopt pollution control measures;

5. many legal instruments will have to be analyzed for reform at a much quicker pace than is usual for the legislature;

6. public participation in the development of projects will be encouraged;

7. environmental issues will be a common topic in schools;

8. scientific information will be in demand and the universities and other institutions that produce such information will be under pressure to do more and better research.

Environmental Education

An official policy of environmental education has not yet been incorporated into Honduras' legal instruments but policy makers within the sector have been and are working with the concept. The official education policy is outlined first by the Constitution of the Republic which assigns the responsibility of all non-formal and formal education (except the university level) to the Ministry of Education. The Constitution charges the National Autonomous University of Honduras (UNAH) with the responsibility for developing all university level education.

A recent policy decision involving environmental education was taken by the new Minister of Education. On February 19, 1990 he circulated an order to the five General Departments that instructs them to contribute decidedly in the effort to conserve the environment. The order encourages the continuation of secondary school social work projects in ecology and forestry, coordination with local municipalities in assigning public park areas for schools to be involved in preserving and improving, continued teacher training in environmental education, and development and execution of education programs to include ecological themes.

Encouraging environmental education is not a new policy for the Ministry of Education. An agreement with COHDEFOR since 1987 has been effective at the level of secondary schools in promoting environmental awareness in youth as well as in their teachers. The ministry has assigned several planners and other education personnel to work with COHDEFOR personnel on many different forestry and educational projects. In COHDEFOR, both the Olancho Forestry Development Project and the Project to Strengthen the Social Forestry System are working directly with teachers employed by the Ministry of Education in rural schools to better equip them with skills and materials for teaching environmental education.

At the university level, several changes have recently taken place that promote environmental education. Efforts at this level could and should be more substantial but no legal incentives for environmental education exist. The legal instruments of university level education are the Organic Law of the UNAH (1957), the Superior Education Law as well as several regulatory acts. None of these instruments addresses environmental education explicitly. Nonetheless, the UNAH has provided support to the Biology Department as well as the Forestry Engineering program, which have been gradually developing their capabilities in the teaching of environmental management. In 1986, an Environmental Research Unit was established in the Department of Scientific Research to promote and coordinate research efforts on environmental themes among university faculty and students with an interdisciplinary approach.

Community participation in environmental education is important for its successful impact. For two years, the Canadian Institute for Research Development has funded a research project carried out by the UNAH entitled "Children as Change Agents". The study has provided intensive health and sanitary education to a population of schoolchildren, teachers and community leaders with the goal of influencing the children's family members to adopt healthy habits. A control population has also been studied. While the results of the study are not yet tabulated there were indications of the projects' early success.

President Callejas stated that the people in government have historically had the greatest power to destroy the environment. He has stated a desire to change the situation by leading an effort to environmentally educate them so that they have the power and desire to contribute to conservation. He plans to begin this effort with a seminar for all newly elected mayors, political governors and ministers that focuses on the importance of environmental planning and forest protection.

Development and Environmental Program Findings and Issues

- Planning activities in Honduras have not adequately addressed environment and natural resource issues.

- Planning for roads is just beginning to include environmental criteria. Political criteria have been the primary criteria.

- The central government has been the most important government institution. Municipalities have played a small fiscal and management role. Proposed changes in the federal system giving more responsibilities and authority to municipal governments will not necessarily improve resource management.

- The proposed General Environmental Law can begin a process of consistent inclusion of environmental criteria into government activities and private behavior. However, weak institutional capacity and unclear institutional responsibilities will need to be addressed.

- Environmental education activities have been expanding in Honduras but need to be further expanded. An awareness of th economic and environmental interdependencies will increase the demand for environmental programs and improved management.

Exhibit 4.4

CORPORACION HONDURENA DE DESARROLLO FORESTAL
INVESTMENT PROGRAM
IMPLEMENTED FORESTRY SECTOR SUPPPORT PROJECTS

Project name	External financing source	Implementing agency	Funds in thousands of lempiras			Beginning	Ending
			Domestic	Foreign	Total		
1. Forestry and Timber Industry Training (CAFIM)	GTZ, Germany	COHDEFOR ESNACIFOR	1,436.4	4,436.4	5,872.8	1985	1988
2. Forestry Genetical Improvement	ODA, England	COHDEFOR	403.9	945.0	1,348.9	1987	1989
3. Technical assistance in the Management of Broadleaf Forest	ODA, England	COHDEFOR	300.0	700.0	1,000.0	1983	1989
4. Institutional Support for the Improvement of the Forestry Activity	FAO/PNUD	COHDEFOR	590.0	1,308.0	1,898.0	1988	1990
5. Forestry Development II	PMA	COHDEFOR	1,131.2	9,188.0	10,319.2	1985	1989
6. Development of the Broadleaf Forest	CAID, Canada	COHDEFOR	6,722.7	19,327.7	26,050.4	1987	1992
7. Support Unit to the Forestry Program	CAID, Canada	COHDEFOR	200.0	2,700.0	2,900.0	1987	1992
8. Forestry Development	AID, USA	COHDEFOR	23,375.8	40,000.0	63,375.8	1988	1994
9. Reforestation Program for the Protection of the Southern Region	COHAAT,Germany	COHDEFOR	238.5	2,121.0	2,359.5	1982	1989
10. Planting of trees for multiple uses (MADELENA)	CATIE	COHDEFOR	620.0	1,200.0	1,820.0	1986	1991
11. Development of Integrated Management Areas - Northwestern Region	England	COHDEFOR	609.0	900.4	1,599.4	1988	1991
12. Restauration of the Broadleaf Areas in the Mosquitia	ACNUR/CEE	COHDEFOR	500.0	2,346.4	2,846.4	1988	1989
TOTAL			36,127.5	85,262.9	121,390.4		

$(16,000: Grants) (24,000.0: Loans)

Source: COHDEFOR, December 1988

Exhibit 4.5

Technical Assistance Projects Underway, Financed By External Donors, that Include Environmental Activities

Project/activity	Source of Assistance	Duration of the project	Assistance to the project : Total	Up to 1986	Nature of the Assistance/ Location of Implementing Unit
FB/8291-86-01 Incorporation of the Environmental Dimension in Integrated Rural Development	PNUMA	1986-1987	18	11	Institutional support for the incorporation of the environmental dimension in Integrated Rural Development in the southern area of the country. Implementing unit: SECPLAN
HON/NR/83/001 Exploration for metals deposits	FRNUERN	1986-1988	1,225	1,046	Mining exploration in three regions: Quitagana, Chanton, and Yuscaron. Implementing unit: S.R.N.
Ecology	UNESCO	1986	20	20	To strengthen the protection and management of the Biosphere reserve of the Platano River.
Irrigation project	AID	1986-1988	22,500	N/A	Expansion of the area under irrigation and improvement of the capabilities of the Honduran Government, private Honduran firms, and private Honduran producers to plan and manage irrigation activities. Implementing unit: S.R.N.
522-0168 Natural Resources Management	AID	1985-1987	14,995	638	Strengthening the capacity of selected public sector institutions involved in the management of natural resources and land use to develop watershed planning models, to increase their capacity to collect and analyze basic data on water resources and land use in the Central and Southern Regions. Implementing units: The Bureau of Water Resources of the S.R.N., the National Cadastre Office, and COHDEFOR.

Project/activity	Source of Assistance	Duration of the project	Assistance to the project : Total	Up to 1986	Nature of the Assistance/ Location of Implementing Unit
Master Plan Tegucigalpa	Italy	1986-1987	3,187	651	Impounding underground water: El Chile Mountain, Tegucigalpa. Implementing unit: SANAA.
ATN/SF/24-HO Institutional Strengthening of S.R.N.	IDB	1984-1988	1,200	45	Institutional strengthening of the Bureau of Mining and Hydrocarbons. Preparation of the Mines Inventory and the National Metalpenetic Map. Implementing unit: D.G.M.H.
HON/86/007 National Forestry Development Program	UNDP/ FAO	1987	157	16	Preliminary preparation for starting the National Forestry Development Program. Implementing unit: COHDEFOR.
HON/82/010 Research and Evaluation of the Main Fishing Ports in the Northern Region of Honduras	UNDP/ FAO/IDB	1984-1987	756	250	To plan and develop, in a rational and efficient way, the utilization of the fishing facilities between Puerto Castilla and the border with Nicaragua. The study may identify investment projects. Implementing unit: S.R.N.
HON/84/004 Water Resources for Small Producers	UNDP/ FAO	1984-1987	1,701	452	Technical assistance to increase agricultural production in areas with existing irrigation systems. Strengthening the technical management capability in the governmental agencies in the area of water resources with the field-level training. Atlantida, Chiluteca, Comayagua, Cortes, Francisco Morazan, Valle, Yoro. Implementing unit: D.G.R.H.
TGP/HON/4509 Legislation on the Environment, Wildlife, and Fisheries.	FAO Norway	1985-1986	55	45	Legal counseling to the Natural Resources Ministry and the preparation of draft bills. Implementing unit: S.R.N.

Project/activity	Source of Assistance	Duration of the project	Assistance to the project : Total	Up to 1986	Nature of the Assistance/ Location of Implementing Unit
CGP/HON/011/NOR Integrated Forestry Management for Social Benefit	FAO	1982-1986	569	14	To develop the marginal forestry communities, with technical and financial support to COHDEFOR. Consultancy of 52.5 m.m., nation-wide. Implementing unit: COHDEFOR.
HON/2742 Forestry Development	WFP	1985-1989	4,600	1,100	To assist the Government in organizing the agricultural producers' groups in forestry areas, to integrate them in a forestry protection, reforestation and soil conservation program, to generate employment and increase family income. Five forestry districts of COHDEFOR.
448/12207 Development of the Broadleaf Forest	Canada: CIDA	N/A	8,000	175	Watershed management and introduction of the Social Forestry System. Atlantic coast. Implementing units: COHDEFOR, S.R.N., INA.
448/10254 Integrated development of the Guayape Valley	Canada	1978-1986	4,300	39	Preparation of a master plan for rural development in the Guayape Valley. Feasibility studies and support to pilot farms for the introduction of new technologies. Implementing unit: DIRCO Pilot Farms.
Fisheries	China	198-1986	N/A	266	Improvement of fishing techniques and seafood processing. Installation of a laboratory in San Lorenzo to train personnel. Gulf of Fonseca. Implementing unit: DIGERENARE.
Forestry Training Program	Finland FINNIDA	1986	6	6	Assistance for forestry development in Honduras.

Project/activity	Source of Assistance	Duration of the project	Assistance to the project : Total	Up to 1986	Nature of the Assistance/ Location of Implementing Unit
HON/9-MARGOAS Rural Development Programs for the Marcala and Goascoran Regions	Switzerland COSUDE	Phases I,II 1979-1990	17,955	2,701	Technical and financial assistance to the Integrated Rural Development Programs for the Marcala and Goascoran regions, covering 10 sectors, to improve the standard of living in those regions. Four experts, consultants and financial support. Consultancies: 17 m.m. Implementing unit: S.R.N.
HON/15/DRI-YORO Integrated Rural Development of the Yoro sub-region	Switzerland COSUDE	Phases I,II 1981-1991	7,425	27	To improve the living standards of the small producers and agrarian reform groups in ** municipalities of the Department of Yoro, through integrated and integral actions oriented to improve incomes and organizational and management skills, and to strengthen the level of satisfaction of their basic needs and support those services aimed at improving the productive and social infrastructure. Consultancies: m.m. Implementing unit: S.R.N.
ATN/SF-2422-HO Study of Ocean Fishing Potential for S.R.N.	IDB	1984-1987	570	229	Research and development of the ocean fishing potential on the northern region of Honduras. Implementing unit: S.R.N.
Epidemiology M.S.P.	WHO-OPS	N/A	153	153	To strengthen the technical and administrative operating capacity of the MSP to control infectious illness. Tegucigalpa. Implementing unit: MSP.
Sanitation MSP, SANAA, DIMA	WHO-OPS	N/A	170	170	To increase the coverage of the potable water and sanitation services, especially in rural and urban marginal areas, strengthening and managerial and operating capacity of the entities in charge of those services. Implementing unit: MSP.

Project/activity	Source of Assistance	Duration of the project	Assistance to the project : Total	Up to 1986	Nature of the Assistance/ Location of Implementing Unit
Development of Health Services, MSP	WHO-OPS	N/A	184	184	To develop planning functions, to increase the capacity to formulate and follow up projects, and to attain better utilization of internal and external resources with regard to the coverage of the services. Tegucigalpa. Implementing unit: MSP.
Human Resources Development	WHO-OPS	N/A	81	81	To coordinate and systematize the planning and activities, formation and use of human resources in the health sector institutions. Tegucigalpa. Implementing unit: MSP.
Control of illnesses caused by vectors	WHO-OPS	N/A	165	165	Assistance with field consultancies, local contracting, supply of equipment and materials, scholarships, courses and local seminars to train personnel in the field, nation-wide. Implementing unit: MSP.
Community medicine	UNICEF ESPAA	1984-1986	94	47	Participation of sixth-year medical students in rural communities and marginal urban areas, providing primary medical care through the Health Centers of the Health Ministry, nation-wide. Implementing unit: Medical Science School, UNAH.
3-P-85-0188 Dengue (in Honduras)	Canada CIDA	1986-1989	67	19	To determine the different types of dengue that exist in the regions of the country and detect the presence of the bleeding dengue syndrome (DHF), to study its epidemiological characteristics, its risk factors and the efficacy of the diagnostic techniques. Implementing unit: UNAH.

Project/activity	Source of Assistance	Duration of the project	Assistance to the project : Total	Up to 1986	Nature of the Assistance/ Location of Implementing Unit
3-P-83-0280 Diarrhea epidemiology	Canada CIDA	1984-1987	154	11	To research the epidemiology of diarrhea in children less than five years old in rural areas. To determine the nutritional condition of the population, to evaluate the relation between the nutritional condition and the incidence of the diarrhea, and to study the social and economic factors that contribute to the incidence of diarrhea. Implementing unit: UNAH.
Servicio Nacional de Acueductos y Alcantarillados (SANAA)	United Kingdom	1980-N/A	N/A	171	N/A
Health infrastructure	PLAN	1985-N/A	N/A	173	Construction and repair of health centers, latrines, potable water and aqueducts to 12,200 families. Francisco Morazon, Comayagua, Sacca, Barbara, and Coran. Implementing unit: MSP.
Health Works	SCH	N/A	98	72	Infrastructure and rural sanitation, primary medical assistance, nutritional attention and implementation of the national policy for children's survival. Tegucigalpa, Fersoire, Intibuca, and Yamaraguila. Implementing unit: SCH, MSP, FRASAR, CARE.
Industrial pollution management	UNIDO	1986	N/A	2	Scholarship to train UNHA personnel. Gante, Belgium. Implementing unit: Pharmacy School.
HON/82/015 Meteorology and Hydrography Applied to Development	UNDP	1982-1986	548	100	Technical assistance and meteorological equipment for the conservation of natural resources and to increase production.

SOURCE: Environmental Management of Honduras. D.G.P.T. SECPLAN, and Perfil Ambiental de Honduras, 1989.

5. CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER ANALYSIS AND RESEARCH

5.1 Introduction

The purpose of a natural resource policy inventory is to examine the wide range of policies and institutions affecting resource use decisions and to develop an agenda for more detailed analysis and research. Such an agenda assumes several normative conclusions on the part of the analyst. First, an implicit or explicit ranking of the problems occurs. In the case of this inventory the four problems areas defined in the USAID Central American Natural Resource And Environmental Strategy served as the basis from which specific circumstances in Honduras were elaborated. Second, the analyst makes a determination of the relative importance of a given policy in affecting the problem. This judgement is often based on limited empirical information and the value paradigm of the analyst. While there has been analysis throughout this inventory report, much of the information provided represents the available positive knowledge of the situation. That is, the analysis describes what is. It is hoped that the conclusions reached here represents studied and thoughtful analysis. However, different values or weights may be applied by the reader and, therefore, different conclusions could or would be reached on the relative importance of a given problem or policy. It is hoped that the descriptive and objective nature of the information provided will allow for a clearer discussion of the weights to be applied other than those used by the authors.

Natural resource and environmental issues while having many short-term characteristics are inherently long-term in that the decisions taken now will affect the availability and quality of resources for future generations. Most resource use decisions taken in Honduras are short-term in nature. This arises from the socio-economic situation in the country and the policies which influence the incentives for resource use. The distribution of land and wealth in Honduras has left the great majority of the population living under marginal conditions. This is represented by high unemployment, poor nutrition and low production. But the overall economic situation has also re-enforced short time horizons among the wealthier elements of society. The economy has essentially been trade rather than investment oriented. There is pressure to obtain foreign exchange which has encouraged mining of resources such as timber and other renewable resources.

Recent macroeconomic and sectoral policy changes by the Callejas government may well improve the situation. Nevertheless change will not be easy nor without distributional and resource management concerns. Given the overall inability of the government to adequately administer the authority it has historically assumed over resource control and ownership, there is good cause to look to other forms of control. However, private sector activities should be approached with some care to the nature and characteristics of resources not addressed by market transactions. Many of the policy analyses and research suggestions made below should also be concerned with the distributional and resource issues occurring with recent macroeconomic changes.

As a recent World Bank analysis noted: "The basic question in implementation of options for intensification, conservation or rehabilitation of renewable resources is how to modify the social institutions which orient the formal and informal processes of decisions by politicians, civil servants and resource users which interact in determining how, where and how many renewable resources are used, and who benefits and who pays in the process." (World Bank, Draft, 1989, p. 31)

5.2 Sustainable Agriculture

A critical issue for Honduras will be to better understand the role of macroeconomic policies and how they affect resource use. These issues are generally complicated and not particularly well understood by either policy makers or economists. The problems of analysis will include differing effects on various resources and the need to address other constraints which will impede what should be happening given the assumptions of the economic model. Honduras has embarked on policy changes which should affect economic conditions in rural areas in both the short-term and long-term. Tenure and wealth distribution issues may not necessarily allow for resource problems to be improved by those changes. To greater and lesser degrees the first four policy study recommendations made below address this issue.

Macroeconomic Policy Changes

Macroeconomic policies have resulted in low prices for agricultural products in Honduras. Until recently the Lempira was overvalued and tariff and trade policies favored imports over exports. For example, an overvalued exchange rate implicitly subsidizes imports and implicitly taxes exports. In April, 1990 the Callejas government freed the exchange rate and also announced changes in tariffs and export taxes. These changes should increase the cost of imports and increase agricultural exports and returns to agriculture. This should provide incentives to increase agricultural production and improve the efficiency of the use of imported inputs such as pesticides.

However, improved resource management may not necessarily be a result of these policy changes. The mining of soil could occur without complementary policies designed to encourage long-term investments to increase productivity. This includes tenure issues. Therefore, the effects of macroeconomic policy changes on agricultural land use and the agricultural frontier should be further studied. If price increases reach the farm level, do they increase pressure on the agricultural frontier or increase productivity on land currently under cultivation? Do those increases in productivity involve soil mining or inappropriate input use in the short run which will result in longer term losses in productivity? It will also be important to study policy effects on forest use and exports because of similar trade-offs as suggested for agriculture. Price improvements could result in resource mining and policies designed to ameliorate these effects should be analyzed.

Sectoral Policy Changes

Sectoral policies have also had the effect of reducing returns to agricultural production. These policies have included producer price controls, public monopoly on basic grain imports, consumer price controls and subsidized credit, among others. The Callejas government has announced decisions to privatize the IHMA silos and to free basic grain imports. Studies are being conducted by the government on other changes, including the system of guaranteed prices based on production costs instead of international prices. These changes should increase returns to agriculture and reduce government expenditures. As with the macroeconomic policy changes mentioned above, it will be necessary to study the effects of these policies on intensification of production in agriculture and the effectiveness of policy changes in reducing pressure on the agricultural frontier. Understanding these issues within the other constraints faced by Honduras will help not only policy management in Honduras but other countries coping with similar issues.

Land tenure insecurity and land distribution

The control of the most fertile farmland in Honduras is held by a small number of people who often use such land for extensive cattle operations. Many small subsistence farmers are forced to farm on highly erodible hillsides or on forest land unsuitable for long-term farming. These lands are officially owned by the government which, however, does not have effective control over their use. In addition, land titling procedures are slow and inhibited by the absence of a cadastre. These factors influence the willingness of the users of resources to invest in long-term resource management. Instead they encourage slash-and-burn and extensive cattle activities. For example, until the Basic Grains Law of 1989, land could be expropriated if planted to basic grains. Cattle raising is de facto immune from expropriation. Therefore, studies of alternative tenurial arrangements for resource use are needed, including methods to develop land markets. For example, what is the effectiveness of the certificates of possession in the LUPE project?

INA and Reform Sector Performance

INA settlements are responsible for approximately 20 percent of the agricultural production of the country. Yet some cooperative lands are under-utilized. One reason is that settlement and cooperative land cannot be owned or mortgaged for twenty years. Few land titles are granted because payments are not made on these lands. There seems to be little incentive for long-term resource management. Credit and technical assistance were also at times provided, but these services have been deficient and much of the credit has not been repaid. Therefore, it is recommended that further analysis study the incentives needed to improve resource management by securing titles. Research should also examine reasons for the concentration on basic grains in the reform sector.

Pesticide Use Alternatives and Credit

While there are many aspects to the pest management and pesticide use issue in Honduras, including deficiencies in the legal structure, issues associated with the availability of credit for non-chemical pest control seem a promising

area for more analysis. Some technology exists to reduce pesticide use but faces the bias of credit institutions in favor of chemical inputs, often short cycle export crops (K. Andrews, personal communication). Credit policy changes are needed to support IPM adoption. Recent macroeconomic policy changes should improve the economic potential of IPM alternatives to intensive pesticide use by improving returns to agriculture and agricultural labor. Analysis should also address credit policy optiors to support commercial insect development for biological control of pests. There are two presently operating in Honduras.

Potential Policies

1. Land Taxes could encourage the development of land markets but will need a complete cadastre. Admittedly the record of successful land tax implementation in Latin America is scarce.

2. Roll-over leases for occupants of public lands could provide security within an economically relevant period for the user. Do you need fee simple title or can a leasing structure adequately address security needs within the time horizon most economically relevant decisions are made?

3. Tax on toxicity of pesticide imports could discourage the import of the more dangerous pesticides. It would be, however, difficult to administer.

5.3 Production from Natural Forests

Pine and broadleaf forests represent two differing but important resource management issues. With pine forests there is documented evidence of its potential for sustained resource management. However, that potential has not be reached and this resource is in effect being mined. Broadleaf forests are disappearing at four times the rate of the pine forests but are seldom commercially exploited. Instead, these forests are being lost to the expanding agricultural frontier. The government of Honduras through COHDEFOR has ownership of all forest resources in the country. It has also had at one time or another control of most production and marketing activities related to lumber. Very little resources or effort has gone into reforestation or management of forests. The mining of timber resources has been basically unchecked under this management regime.

Open access resources, resources not effectively controlled by any one user or user group, are resources where the incentives are to over-exploit or mine the resource. This is the case because forbearance by one user is not matched by other users. The incentives are to get as much as possible before others get to it first. This is the case with forest resources in Honduras. While the government claims ownership and has regulations governing behavior, that control is ineffective. Most of the policy analyses recommended below examine various alternative forms of control of forest resources. This ranges from private ownership of land (now being actively considered by the Callejas government) improved community management of land (AMI) and better management of government owned land by consideration of appropriate leasing concessions. All of these

activities have the potential of improving effective resource control and providing incentives for sustained use management. Nevertheless, these approaches should also consider interdependence with other factors which may lead to poor resource management. These include macroeconomic conditions which favor trade over production activities.

Private Sector Incentives and Regulations

COHDEFOR has statutory control and ownership of the forest resources of Honduras. COHDEFOR activities have, however, focused on production and marketing. The government cannot adequately administer the authority over trees it has assumed. This has resulted in an open access resource which is under no effective control by any resource user. Therefore, no one has an incentive to manage the resource for sustainable use. Instead the resource is mined or more commonly destroyed by slash-and-burn agriculture or by cattle operations. Given these conditions private ownership of forests could be considered a viable alternative. Since management, even by the private sector, often depends on time preferences which do not support sustainable uses, effective regulatory policy will also be needed. Therefore, it is recommended that the incentives and regulations needed to ensure sustained forest management by private sector ownership and control of trees and forests be further studied.

Role and Potential of AMI

COHDEFOR has assigned limited financial resources (1%) to AMI activities. It is of little surprise, therefore, that AMI have not functioned well. The potential of AMI have not been fully developed or examined. There are many successful social forestry systems in developing countries. Experience from these can be incorporated into the Honduran system but further research and analysis should isolate the nature of the problems. This system would represent, along with private ownership and better management of concessions, an important approach to developing sustained resource use. It is recommended that problems and policies as well as fiscal requirements to make AMI successful be studied and further appraised.

Timber Concession

There is at present a minimal amount of forest land being managed for sustained timber production. The concept of tributary areas for timber companies have encountered conflicts with other users and do not correspond with AMI settlements. Many issues have contributed to uncertainty about the concession regime. The problems and role of tributary areas and alternative form of long-term concessions should be studied and the incentives needed to support sustainable use understood and incorporated into policies.

INA and Land Tenure Policies

INA has a number of policies which have contributed significantly to deforestation. For example, ninety percent of land on cooperative land must be in agricultural production. Perhaps more importantly forest land is considered vacant and subject to expropriation. This has encouraged destruction of forests in favor of cattle production. As reported above, this is land often better

suited to timber. Elimination of policies which encourage deforestation should be immediately suspended while guidelines are developed to establish procedures which will appropriate land uses. Alternative rules or systems for INA land conversions should be studied. Clearly institutional capacity will have to be improved to result in improved land use decisions.

Stumpage Fee Administration

Stumpage fees are applied to extracted and not standing timber in most cases. As administered the stumpage fees are leading to wasteful resource use. The institutional capacity of COHDEFOR will have to be improved to perform forest assessments and application of the stumpage fee. Further analysis should review the requirements needed to ensure adequate administration of stumpage fees throughout Honduras. Are their other obstacles to successful implementation of stumpage fees?

Potential Policies

1. Fiscal incentives for reforestation, while a fiscal burden to the government, may be more cost effective than government reforestation projects.

2. The forest fund, currently in draft form, would provide the funds needed to finance incentives for reforestation and better use of forest products. What private sector activities could be aided by fiscal incentives?

5.4 Watershed Management

The issues associated with watershed management are quite varied but point to some systematic problems in resource management. The lack of institutional capacity to implement controls or regulations and maintain existing infrastructure undermines many government activities. Policy issues can in part focus on fiscal issues associated with recurrent costs and allocation of public expenditure. There will, however, always be a need to establish priorities among problems and policy choices. The information needed to make those choices is often scarce. Nevertheless systematic inclusion of environmental information as designed into the proposed environmental law can begin to address issues which can improve sustainable management and hence, in the long-run, improve the ability of the government to address economic development projects.

Coastal Land Concessions

Legislation prohibits or restricts mangrove use. Nevertheless, control and management of mangrove forests are ineffective. Numerous agencies have responsibilities which conflict and concession procedures are long. There are many, often conflicting, uses for mangroves including fuelwood, fish and shrimp larvae production, salt ponds, and shrimp farms. These resources may also be affected by agricultural, urban and industrial pollution from the Choluteca river. It will be necessary to study the complex interdependence between various users of coastal resources as well as incentives needed for sustained use of

resources. The economic and environmental trade-offs between users as affected by policies will need further analysis as well.

Pollution Regulations

The Fisheries law prohibits all noxious waste discharges into water. Other legislation is similarly structured. However, control of pollution is minimal and fines are inadequate. The permit system is ineffective. The need for foreign exchange is encouraging mining activities but environmental controls are inadequate. Some pollution, heavy metals for example, persist in the environment for a long time. Prohibitions in this case are reasonable policy tools. However, regulatory authority has not been managed well and methods will need to be studied to improve performance. With other forms of pollution alternatives should be studied including the relative ease of either standards or taxes.

Irrigation Management and Development

Irrigation development in Honduras is limited and concentrated in the private sector. Much of the public sector systems operate at 30 percent efficiency and suffer the problems of recurrent costs common with irrigation systems in many developing countries. The proposed Choluteca project would significantly increase installed irrigation in the public sector but may also have downstream effects on Gulf of Fonseca activities. Irrigation potential has been undeveloped because of short-term trade versus production focus of the economy and government fiscal problems and priorities, among others. Policy issues for further study include economic incentives for improved irrigation management, including the pricing of water. The effects of improved agricultural prices on irrigation development and the potential for reducing pressure on the agricultural frontier should also be studied: Can an increase in properly managed irrigation development contribute to a reduction in the pressure on marginal agricultural land conversion? This would include examination of the beneficiaries and other equity issues. In addition, potential pesticide run-off from the Choluteca project should be assessed since both economic and environmental effects could be significant.

Hydroelectric Management and Development

Watershed management activities have not been an important element of hydroelectric planning or a government priority. Problems developed very quickly for the El Nispero dam, severely reducing its economic life. Only now is a watershed management strategy being developed for the important El Cajon dam watershed. It will be necessary to examine the types of policies and regulations which determine the scope of environmental and benefit/cost analysis applied to hydroelectric projects. Inclusion or application of such analysis when properly performed should isolate environmental and economic problems of such projects. These issues should also be assessed within the context of rural versus urban electrification.

Water User Fee

Two fees for the use of water exist: one water user fee for agricultural uses and one surcharge for irrigation districts. Only two percent of agricultural users are registered and collection of the fee is restricted to very large users. The fee and surcharge collect little revenue because of inadequate administrative capacity and low rates, among others. However, the potential for these fees to contribute to revenues is quite large. A review of water ownership policies to determine incentives needed for better water use should begin a process which should include examination of alternative water ownership systems as well as, more narrowly, improvements in the administration of the current fee structure and costs and benefits of the fees. Information can be brought to bear from other developing countries on these water pricing issues.

Potential Policies

1. Pollution taxes would make the polluter responsible for costs now transferred to others. Administration of such a system or various alternatives to pollution taxes might prove easier to administer than prohibitions have shown themselves to be.

2. The Environmental Law which has been under consideration since 1985 requires environmental assessments which at a minimum focuses attention on the potential environmental trade-offs.

3. The Natural Resources Code under discussion by the Callejas government would unify many resource management activities affecting all resource problem areas. This process has the potential of resolving some of the administrative issues and overlapping and conflicting institutional responsibilities.

5.5 Wildlands and Biodiversity

One cannot examine the issues associated with the protection of wildlands and biodiversity without being struck by the contrast between what has been legally established and actual performance in meeting those commitments. The problem is exacerbated by multiple legal and institutional authorities which overlap and conflict but are often irrelevant to what actually happens to these resources. Unfortunately, the loses of unique resources and wildlife are frequently irreversible. Furthermore, wildlife issues are perhaps the most extreme case of intergenerational resource interdependence. Policy reform in this problem area, as well as the others, will require a better understanding by the public of the consequences of these destructive activities. Methods will have to be developed to make short-term and long-term resource and economic decisions compatible.

Multiple Agency Responsibilities for Parks and Reserves

The Rio Platano Biosphere Reserve includes activities by SRN, RENARE, AHE, COHDEFOR, INA, among others. This is but one example of many different institutional authorities which influence different parks and reserves. Conflicting institutional objectives and lack of coordination and cooperation by these institutions inhibit park management and is wasteful of scarce resources. These conflicting policies should be studied as they affect both parks and buffer zones. Recommendations should resolve whether one institution should have responsibility for a particular park or reserve. The present ad hoc system of paper parks does not lead to adequate management

Multiple Park Legislation and lack of Regulations

There are at least ten separate laws creating various parks and reserves. Many do not have regulations. This issue is a companion and concomitant issue to the multiple agency responsibility but deserves separate attention because of the lack of criteria used in determining the creation of parks. Does the current park system adequately address the biodiversity needs of Honduras? If so, it is more or less accidental. Policies should be analyzed, including unified legislation and administration, which can increase effective management and protection of parks. This includes fiscal requirements and addressing tenure and buffer zone issues.

INA Policies

INA has developed settlements inside of existing parks such as Lake Yojoa and Rio Platano. While it may be relatively easy on paper to change these particular activities by INA, land tenure and distribution issues will continue to put pressure on resource use. Therefore, studies should include buffer zone policies. This could include successful examples from other countries. It is also clear that studies of alternative policies for settlements by INA will be needed.

Quotas and Endangered Species Exports

Reported official and unofficial exports of endangered species, especially parrots, are very high. Despite membership in CITES and existence of quotas, control has been poor. For this reason President Callejas has banned all exports pending further study. By CITES treaty obligations some endangered species are banned from export. Policies to address deeply rooted resource problems will have to be successful to prevent irreversible loss of species or habitat. Policy studies of alternatives that reduce trade in endangered species should include taxes and education.

Agricultural Practices and Biodiversity

Policies which lead to greater pesticide use and mono-cultural agriculture can cause local wildlife problems. While evidence of wildlife effects from pesticide use do not exist, domestic cattle have been shown to have high pesticide residue levels. While intensive agriculture can reduce pressure on the agricultural frontier, local populations and habitats can be harmed. Studies of

policy incentives for habitat preservation within agricultural development areas may lead to amelioration of some of the negative effects. The process of accounting for these effects will not be easy. Even though the relationship between post larvae shrimp, mangrove forests and shrimp mariculture are understood, resource use decisions by the shrimp industry, local fishermen and other mangrove users are presently causing problems for commercial shrimp production.

Potential Policies

1. Debt-for-nature swaps can allow a means to provide for protection of critical natural areas and contribute to their protection. President Callejas has announced interest in developing this option.

2. Conservation stamps or an environmental tax on resource based exports such as timber might help to pay for improved resource management activities.

5.6 Conclusions

While many points and assessments have been made about the policy issues in Honduras, the four points below are central to further analysis of resource and environmental problems.

1. The policies discussed above are representative of a large number issues discussed in this inventory. While the discussion has been organized around a set of taxonomies for both problems and policies, these policies have cumulative, interactive and interdependent effects. Those effects have been noted where appropriate in the text. It will be necessary to take into consideration other policies when analyzing a given priority policy. Not to do so can lead to unintended effects when new policies are implemented. Successful policy reforms will likely have to consist of packages of policy changes which link macroeconomic, sectoral, tenure and regulatory changes.

2. Short-run and long-run economic and environmental trade-offs, when they are understood, present difficult choices to decision makers. Analysis of policy options for resource and environmental problems will generally have to be concerned with such issues even though greater knowledge may make political decisions harder to make as the losers and winners are identified in an intra-generational and inter-generational sense. This process will require those who make the decisions, the present generation, to reassess their values and the weights they apply to the natural resource and environmental patrimony left for the future.

3. Policies will have to be designed to influence decisions and incentives at the resource user level. Often policies exist which have perverse effects on resource decisions by, for example, making sustainable resource management practices more expensive than resource mining. This will be a challenge to policy design in

Honduras since much of the rural population lives in extreme poverty and does not have access to good land. Nevertheless, successful development of the country in the long-term requires some trade-offs as well as changes in the concentration of wealth.

4. Over time and by historical tradition Honduras as a state has assumed the ownership of most of its resources: land, water and trees, for example. The government, however, cannot manage or control the use of these resources in any effective sense. This lack of control has, in part, increased the rate of renewable resource depletion and allowed pollution, although regulations exist which prohibits such activities. Other ownership arrangements will be needed to assure successful resource management. This will likely continue the need for government involvement where it is appropriate to correct for problems from market transactions or communal management, among others.

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