UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

HONDURAS

PROJECT PAPER

FORESTRY DEVELOPMENT

AID/LAC/P-420

Loan Number: 522-T-056
522-T-056 A & B
Project Number: 522-0246

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: ____

DOCUMENT CODE: 3

COUNTRY/ENTITY: HONDURAS

3. PROJECT NUMBER: 522-0246 — 522-T-056 4:B

4. BUREAU/OFFICE: LAC — 05

5. PROJECT TITLE (maximum 40 characters): FORESTRY DEVELOPMENT

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 12 DD 30 YY 94

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 88 B. Quarter 1 C. Final FY 94

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 88 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(1,250)	(720)	(2,000)	(5,886)	(2,114)	(8,000)
(Loan)	(2,376)	(924)	(3,300)	(5,994)	(6,006)	(12,000)
Other U.S. 1.						
Other U.S. 2.						
Host Country		819	819		11,688	11,688
Other Donor(s)						
TOTALS	3,626	2,463	6,119	11,880	19,808	31,688

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ARDN	270	096	096			2,000	3,300	8,000	12,000
(2)									
(3)									
(4)									
TOTALS						2,000	3,300	8,000	12,000

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 010, 040, 060, 210

11. SECONDARY PURPOSE CODE:

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
A. Code: BR
B. Amount:

13. PROJECT PURPOSE (maximum 480 characters)

To improve the management and sustainable productivity of commercial pine forestry and the efficiency of industrial conversion and marketing of wood products.

14. SCHEDULED EVALUATIONS
Interim MM 11 YY 88 — MM 11 YY 90 — Final MM 11 YY 94

15. SOURCE/ORIGIN OF GOODS AND SERVICES: ☒ 000 ☒ 941 ☒ Local ☐ Other (Specify) ____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment)

17. APPROVED BY
Signature: John A. Sanbrailo
Title: John A. Sanbrailo, Mission Director
Date Signed: MM 12 DD 18 YY 87

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM 11 DD 19 YY 88

a

PROJECT AUTHORIZATION

Name of Country: Honduras

Name of Project: Forestry Development

Number of Project: 522-0246

Number of Loan:

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Forestry Development Project for Honduras involving planned obligations of not to exceed TWELVE MILLION U.S. DOLLARS (US$12,000,000) in loan funds and EIGHT MILLION U.S. DOLLARS (US$8,000,000) in grant funds over a seven-year period from date of authorization, subject to the availability of funds, in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project. The planned life of the project is seven years from the date of initial obligation.

2. The Project will improve the management and sustainable productivity of commercial pine forests and the efficiency of industrial conversion and marketing of wood products. The project will consist of three inter-related components: (1) institutional re-orientation of the Honduran Forestry Development Corporation (COHDEFOR); (2) forest management of selected areas; and (3) strengthening of the private sector industry.

3. The Project Agreements, which may be negotiated and executed by the officer(s) to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a) Interest Rate and Terms of Repayment (Loan). The Cooperating Country shall repay the loan to A.I.D. in U.S. Dollars withing forty (40) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in U.S. Dollars interest from the Date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first (10) years, three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b) Source and Origin of Goods and Services (Loan). Goods financed by A.I.D. under the Loan shall have their source and origin in the U.S. (Code 000), and the countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of goods or services financed by A.I.D. under the Loan shall have their nationality in the U.S., and the countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in

b

writing. Ocean shipping financed by A.I.D. under the Loan shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the U.S., the Cooperating Country and other countries included in Code 941.

c) Source and Origin of Goods and Services (Grant). Goods financed by A.I.D. under the Grant shall have their source and origin in the United States, and countries of the Central American Common Market, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of goods or services financed by A.I.D. under the grant shall have their nationality in the United States, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Grant shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the U.S.

d) Conditions Precedent to Disbursement. In addition to the standard conditions precedent for initial disbursement regarding the opinion of the Attorney General and designation of representatives, the Agreement shall contain the following:

1) The Borrower/Grantee will furnish to A.I.D. evidence that the Project Implementation Unit has been established and staffed including the assignment of a full time Environmental Review Officer, within 120 days of the signing of the Project Agreement.

2) The Borrower/Grantee will furnish to A.I.D. evidence by January 31, 1989 that the Government of Honduras has formulated, and is committed to implement a Forest Management Plan for the La Unión Area.

3) The Borrower/Grantee will furnish to A.I.D. evidence by January 31, 1989 that the GOH has formulated and is committed to implement a consistent rational policy concerning the use of the pine forest of La Unión in particular and the country in general.

4) The Borrower/Grantee will furnish evidence by January 31, 1989 that two biological/hydrological reserves (No. 1: Montaña La Muralla and Los Higuerales, Las Porras; and No. 2: Montaña El Armado-Romperculo and El Coquerón) have been legally decreed and delimited in the field with boundary markers.

5) The Borrower/Grantee will furnish evidence by January 31, 1989, that a comprehensive personnel management plan has been developed by COHDEFOR and approved by its Board of Directors, and that the Board of Directors has made a formal motion to make the personnel plan operational.

e) Special Covenants. The Borrower/Grantee shall covenant to:

1) Regulate and supervise timber sales to ensure that private loggers and sawmillers comply with the management practices and

recommendations as stated in the Project Environmental Assessment and in the Forest Management Plan.

2) Continue to implement, on a nationwide basis, a private-sector-oriented lumber marketing and processing system; this will include further enhancement of private sector participation and the continued use of clear and objective eligibility criteria to insure impartiality in the lumber marketing export system.

3) Continue to implement the policy for liquidation, or transfer to the private sector, of COHDEFOR sawmills and lumberyards.

4) Reaffirm its commitment to ensure that COHDEFOR not establish new production activities which compete with private sector endeavors.

5) Change, on a nationwide basis, its present sales system to that of selling forest resources according to standing timber volumes by January 31, 1990.

6) Establish in conjuction with the Parties, an evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the program will include, during the implementation of the Project and at one or more points thereafter: (a) evaluation of progress toward attainment of the objectives of the Project; (b) identification and evaluation of problem areas or constraints which may inhibit such attainment; (c) assessment of how such information may be used to help overcome such problems; and (d) evaluation of the overall development impact of the Project.

7) Permit project personnel to be contracted on a multi-year basis.

8) Maintain the role of the Central Bank of Honduras, in the rediscounting of credit to the sawmill industry, as one of insuring that (a) the loan purpose is adhered to, and (b) that all documents necessary for its rediscount are in order.

John A. Sanbrailo
John A. Sanbrailo
Mission Director

12/18/87
Date

Clearances:

RPeters, RD	In Draft (see attached clearance pages)
MLikar, PSP	" "
ESzepesy, DP	" "
BSmith, HRD	" "
DRobbins, CONT	" "
JLapittus, EPA	" "
CLeonard, DMD	" "
Doc: 2375C F23	

TABLE OF CONTENTS

		PAGE
I.	SUMMARY AND RECOMMENDATIONS	
	A. Summary	1
	B. Recommendations	2
II.	BACKGROUND	
	A. Country Setting	
	1. Economic Overview	2
	2. Social Overview	3
	B. Agriculture and the Forestry Sector	
	1. The Physical Environment	4
	2. The Agricultural Sector	6
	3. Forest Resources	7
	4. Management of Forest Resources	10
	C. Problem Statement	10
	D. Constraints	
	1. Policy Constraints	13
	2. Institutional Constraints	14
	3. Technical Constraints	15
	4. Financial Cosntraints	15
	5. Social Constraint	17
	E. GOH Forestry Sector Strategy	17
III.	PROJECT DESCRIPTION	
	A. Project Goal	18
	B. Project Purpose	18
	C. Project Components	18
	1. Institutional Reorientation of COHDEFOR	19
	a. Activities	
	i. Stumpage Sale and Valuation System	19
	ii. Lumber Export Regulation	20
	iii. Management Systems Improvement	21
	2. Forest Management of Selected Areas	23
	a. Project Areas	
	b. Activities	
	i. Forest Management Plans	25
	ii. Forest Protection	25
	iii. Road Networks	27
	iv. Silviculture	28
	v. Small Forest Enterprise	31
	vi. Improved Agricultural and Grazing Practices	32
	3. Strengthening the Forest Industry	
	a. Activities	
	i. Timber Utilization	33
	ii. Sawmill Efficiency	34
	iii. Credit	35

PAGE

D. Financial Plan 37
1. Disbursement System 37
2. Audits 37
3. Method of Financing 50
4. PASA Justification with U.S. Forest Services 51
5. Project Outputs 54

IV. PROJECT IMPLEMENTATION ARRANGEMENTS
A. Project Organization 55
B. GOH Entities Involved in Project Implementation
1. Project Implementation Unit 57
2. COHDEFOR units responsible for stumpage sale and valuation 57
a. INFONAC
b. Regional Forest Offices 57
3. Forest Management Units - La Unión and Second Forest Management Unit Areas 58
4. The Natural Resource Management Project (NRMP) 59
5. ESNACIFOR 59
6. Forest Industry Technical Assistance Unit 60
C. Forest Enterprise PVO Contractor 60
D. Role and Responsibilities of USAID 60
E. Implementation Period 61
F. Implementation Plan 61
G. Procurement Plan 61
H. Evaluation 72
1. General 72
2. Data Requirements 72
a. Baseline Data 72
i. Institutional Strengthening of COHDEFOR 72
ii. Forest Management 73
iii. Strengthening of the Forest Industry 73
b. Survey Data 73
c. Project Data 74

V. PROGRAM FACTORS
A. Conformity with Host Country Strategy and Programs 74
B. Relationsship to A.I.D. Polices and USAID/Honduras Strategy 75
C. Relevant Experience with similar projects 76
D. Other Donor Activities 77

		PAGE
VI.	SUMMARY PROJECT ANALYSES	78
	A. Economic Analysis	78
	1. Source of economic benefits	78
	2. Magnitude of benefits	78
	3. Key Issues	79
	B. Administrative Analysis	81
	1. COHDEFOR	81
	2. AMAHDO	82
	C. Technical Analysis	83
	1. Institutional Reorientation of COHDEFOR	83
	2. Forest Management	84
	3. Strengthening the Forest Industry	85
	4. Conclusions	85
	D. Social Analysis	86
	1. Description of the Target Population	86
	a. Basic Grain Growers	86
	b. Coffee Growers	86
	c. Cattlemen	86
	2. Sociocultural Feasibility	87
	E. Environmental Analysis	88

ANNEXES

A. Logical Framework
B. List of Conditions Precedent
C. PID Guidance Cable
D. GOH Letter of Request
E. 611(a) and 611(e) Certifications
F. Country Checklist
G. Economic Analysis
I. Training Analysis
H. Technical Analysis
J. Social Analysis
K. Environmental Analysis
L. Administrative Analysis
M. Implementation Plan
N. Bibliography

LIST OF ACRONYMS

AMADHO	Honduran Association of Sawmill Operators
AMI	Integrated Management Areas
BANADESA	National Agricultural Development Bank
CBH	Central Bank of Honduras
CD	Commercial Department (COHDEFOR)
CDI	Center for Industrial Development
COHDEFOR	Honduran Corporation for Forestry Development
DBH	diameter at breast height
ESNACIFOR	National Forestry School
FAO	Food and Agriculture Organization of the United Nations
FIDE	Foundation for Entreprenuerial Research and Development
FMP	Forest Management Plan
FMU	Forest Management Unit
GDP	Gross Domestic Product
IEE	Initial Environmental Examination
INA	National Agrarian Institute
INFONAC	National Forests Inventory Unit (COHDEFOR)
MBF	metric board foot
MNR	Ministry of Natural Resources
NGO	Non-Government Organization
NRMP	Natural Resources Management Project
PB	Private Bank
PIU	Project Implementation Unit
PO	Personnel Office (COHDEFOR)
PTR	Rural Technologies Project
PVO	Private Voluntary Organization
USAID	United States Agency for International Development
USFS	United States Forest Service
USPAC	United States Presidential Agricultural Commission
WID	Women In Development
WMU	Watershed Management Units

EXHIBITS

NUMBER	TITLE	PAGE
1.	Surface Configuration of Honduras	5
2.	Forest Map of Honduras	8
3.	Sawmill Production Levels in 1985	9
4.	Functional and Organizational Structure of COHDEFOR	11
5.	La Union Forest Management Area	24
6.	Silviculture Scheme for La Unión Area	29
7.	Summary Cost Estimate and Financial Plan	38
8.	Project Disbursement Plan	43
9.	Organization of the Forestry Development Project	56
10.	Approximation of Volume of Pine Sawn Timber Per District	58
11.	Implementation Schedule	62
12.	Procurement Plan	70
13.	Summary of Principal Project Level and Macro Level Impact of the Forestry Project	80

MAJOR ISSUES DISCUSSED IN THE MISSION REVIEW OF THE PROJECT PAPER

The following section is a summary of three critical issues raised, discussed and resolved during the review of the project paper. It should be pointed out, that there were other minor issues discussed at this review, however these three are highlighted because they are central to the design of the project.

A. PUBLIC/PRIVATE SECTOR SPLIT AND FOCUS OF PROJECT ACTIVITIES

During the review of the Forestry Project Paper, the issue of the proper role and functions of COHDEFOR vis-a-vis forest management, the export of lumber and the commercial production of lumber and the overall public/private sector balance of the project, were discussed. The major points brought out in the discussion were the following.

Several review participants pointed out that perhaps the project was too heavily weighted toward strengthening COHDEFOR, a parastatal, and that the type of activities proposed in the project would tighten COHDEFOR's control over commercialization of the forest resource, rather than moving it away from commercialization and re-focusing its attention on the traditional forest service functions of forest management and conservation. After much discussion on this point, it was agreed that COHDEFOR does have a definite role in the management and conservation of the forest resource, and in regulating the commercialization and export of lumber. It was also decided that promotion of Honduran lumber activities would be transfered to AHMADO, the National Sawmillers Association.

COHDEFOR's mandate, as described in, Decree No. 103, its founding laws states that COHDEFOR is to manage, conserve and rationally exploit the forest resource of Honduras. Since its inception in 1974, COHDEFOR has primarily concentrated its efforts in the commercialization and export of lumber, establishing several commercial subsidiaries to process and export lumber. Until recently, the corporation has paid little attention to forest management and conservation. Beginning in 1985, several policy and structural changes occurred initiating COHDEFOR's shift from commercial activities emphasizing instead forest service functions of forest management and conservation.

Another point raised during the PP review was the appropriateness of A.I.D. support to a parastatal in light of the Agency's policy on Private Enterprise Development. The A.I.D. policy of Private Enterprise Development (March 1985) states that "A.I.D. assistance to or through parastatal should be given in the context of exposing the parastatal to market forces and scheduled divestiture of the government interest." The policy goes on to say that this process of getting a government commitment to move away from its commercial enterprise function will be an evolutionary process. The project as proposed is consistent with this A.I.D. policy. It is precisely the objective of this project to move COHDEFOR away from its focus on commercialization and assist it in providing good forestry extension and forestry management services. COHDEFOR is going forward with a schedule of divestiture of its subsidiaries, and has taken steps to re-orient its internal structure to focus on forest

management, conservation, and regulation of private sector marketing activities.

The project will capitalize on these actions taken by COHDEFOR, and will provide financing and technical assistance to re-orient the organization's role and functions. It should be pointed out that the A.I.D. Private Enterprise Development Policy Paper further states that experience has shown that "measures to improve the management and operational efficiency of a parastatal has helped the divestiture process". The Project will provide assistance to COHDEFOR to streamline its internal management and financial operations, and to make it a more efficient organization.

It is recognized that the project places somewhat more emphasis on the public sector, however the project is directly and indirectly providing assistance to the private sector forest industry. The project will provide technical assistance to the Honduran Association of Sawmill Operators, AHMADO, to develop a policy agenda for the forest industry to negotiate with the Government of Honduras. Under the project, AHAMDO will begin to provide its members with industry-wide marketing analyses and research, and will assume the responsibility of promoting Honduran forestry products for internal and external markets. The project will support AHMADO in these activities by providing technical assistance and financing. It should be pointed out that COHDEFOR will no longer be involved in direct lumber exporting activities, but will refocus its Commercial Department functions to provide support to lumber exporters, and to regulate quality control of exports.

Furthermore, the project will establish a line of credit in Lempiras and US Dollars to facilitate the purchase of sawmill equipment for modernizing and renovating small-and medium-sized privately-owned sawmills. The project will also provide technical assistance to these sawmills to improve their efficiency and productivity.

Finally, the project will promote income generating activities for a wide sector of the population living in and near the project area. These activities will be designed in such a way that the population can derive economic benefits from the resource without damaging or destroying the forest. A private contractor will be hired by the Project to work with the inhabitants of the Project area in establishing small forestry enterprises which may include charcoal production, the manufacture of wood products from small dimension logs, oxen logging operations and production of railroad ties among others.

In summary, the project has tried to strike a balance between the interests and needs of the private forest industry and the need of the public sector to manage and protect a public good, the forest resource. It is anticipated that by the end of the project there will exist a public forest service, COHDEFOR, which is efficiently managed and which is dedicated to rationally managing and conserving the forest resource, and to providing solid technical and administrative support to the private forest industry. Furthermore, it is anticipated that as a result of this project, the forest industry will be

utilizing the forest resource more efficiently, will be better organized and informed to maintain an open dialog with the GOH.

B. CREDIT

During the review of the Project Paper, concern was raised as to the necessity of a directed line of credit for the Project. The Project Design Committee is of the opinion that a directed line of credit is needed for the following reasons.

The target group that the Project credit line aims to address is the small- and medium-scale sawmill operators. This group has extremely limited access to credit in the open banking system because of what the system perceives to be the very high risks associated with this industry. The sawmillers are generally small operators who are remotely located, have a high risk of fire, and often have nothing to offer as collateral while the banks usually require 200% collateral including urban property.

Furthermore, the Project is trying to cause a change in the sawmiller method of operation through the introduction of new technology to make the sawmill more efficient and productive. A directed line of credit is needed to offset the lending risk associated with the introduction of new technology. Furthermore, a directed line of credit for the purchase of equipment and replacement parts will facilitate the change over from circular saws being used now, to the more efficient band saw.

In terms of forest conservation and the long-term economic sustainability of the resource, the sooner the industry converts to this more efficient band saw, the more lumber feet can be produced from the same area of land, and the waste that is currently taking place will be reduced. The use of a directed line of credit will cause this change to occur much more rapidly than otherwise would occur, if the sawmill industry were to depend solely on the commercial credit available.

Although there are numerous lines of credit available from various international institutions for working capital and financing of fixed assets, they do not provide financing for primary forest industries or are insufficient to meet the beneficiaries requirements. For example, there exists a line of credit from the European Economic Community, "Linea de Rehabilitaciôn Para Pequeña y Mediana Industria". This is a $20-million line available for all five Central American countries - Honduras has $4 million - and is available for working capital and fixed assets financing. However, working capital financing is available only for up to six months. Financing for fixed assets is limited to a maximum of three years. The terms of this line do not meet the needs of the Project's target beneficiary group. Loan terms for fixed assets would have to be up to seven years in order for the small sawmiller to be able to repay the loan and still stay in business.

Based on the above discussion, it was agreed in the PP review meeting that a specialized line of credit was indeed justified for the Project.

C. FIRE CONTROL ACTIVITIES

An A.I.D. Regional Inspector General (RIG) audit of the Mission Natural Resources Management Project (522-0168) indicated a concern on the part of the auditors that the Project might not be doing enough in the area of fire fighting. Although this audit recommendation was closed by the RIG, part of the Mission's response included the statement that the new Forestry Development Project would include field activities designed to detect and control forest fires in Project areas. The RIG audit specifically identified training of campesinos and the formation of fire fighting brigades in rural areas as key concerns. In the new Project fire detection and control are key elements in the Forestry Management Plans (FMP) for La Union and subsequently identified management areas. Project funds will be used to construct fire watch towers, train campesinos in fire prevention and control, and establish and equip a series of fire fighting brigades. Hence, the implementation plan for this Project is fully consistent with RIG concerns in this area.

SUMMARY AND RECOMMENDATIONS

A. Summary

The purpose of the project is to improve the management and sustainable productivity of commmercial pine forests and the efficiency of industrial conversion and marketing of wood products. The project will address one of the most critical problems facing the Honduran agricultural sector, viz., the rapid depletion of the country's forest resources and the parallel decline of the lumber industry and substantial environmental impacts. Over the past 20 years, the broadleaf forests have declined by approximately 50 percent, falling from 4 million hectares to 2 million hectares. During the same period, the volume of pine forests has been reduced from 48 million cubic meters to 28 million cubic meters. Since 1978 lumber exports have declined from 1.8 million cubic meters per year to about 1.3 million cubic meters annually. If the forest depletion trend is not reversed, in less than two generations there will not be sufficient resources to sustain the commercial wood product industry, leaving thousands of families without employment and causing a severe hardship on the nation's economy. Moreover, the environmental quality and productivity of the country will be irrevocably and severely damaged.

The project consists of three integrally related components: (1) institutional reorientation of the Honduran Development Corporation (COHDEFOR); (2) forest management; and (3) strengthening of the private sector forest industry. The centerpiece of the institutional reorientation component is the formulation and implementation of policies (e.g., stumpage valuation and timber sales) and technical/environmental procedures to rationalize the utilization of the forest resources. It also includes the upgrading of COHDEFOR institutional capacity -- e.g., financial management, personnel procedures and operational processes. The underlying objective of these activities is to enhance the Corporation's capability to manage the forest as a renewable natural resource and support the private sector in commercializing lumber and wood products. The forest management component will consist of a package of forest protection, environmental management and forest utilization interventions that will be applied, on a pilot basis, in two forest areas. The protection activities include fire prevention, fire suppression, disease control and environmental protection. Forest utilization efforts focus on the application of modern logging and silviculture practices. These technologies will be monitored, and refined where necessary, so that by the end of the project a set of treatments will be available for application throughout the country. The private sector strengthening component is composed of technical assistance, training, and credit to support loggers, sawmillers and lumber exporters in improving the productivity of the wood products industry. A technological package of management practices and environmental/technical guidelines accompany the credit to assure sound resource management and protection.

COHDEFOR will be the lead public sector executing agency for the project. Through a Project Implementation Unit that will be created for this effort, the Corporation will coordinate most project inputs. The Ministry of Natural Resources, through the technical personnel of the A.I.D.-financed Natural Resources Management Project, will assist the Corporation to carry out agricultural extension among the farmers in the target areas. A private

contractor, either a Private Voluntary Organization or a for-profit firm, will be engaged to establish a program with the beneficiaries. The credit resources for the private sector will be managed by a local bank that will be selected by bidding. A local Honduran consulting firm will provide technical assistance to the loggers and sawmillers in the packaging of loan applications.

The project will last for seven years. Its total cost will be $32 million. The A.I.D. contribution will be $12 million in loan funds and $8 million in grant funds. The A.I.D. resources will be complemented by a Government of Honduras contribution, cash and in-kind, of slightly over $12 million.

B. Recommendations

The USAID/Honduras Project Committee has determined that the proposed activities are technically, administratively, economically, financially, environmentally and socially sound. The specific analyses carried out during the intensive review indicated that all identified obstacles can be overcome. It is the Committee's judgement that the project, as designed, can and will achieve its purpose.

The project is in conformity with the Agency's policies on Agricultural Development, Environmental and Natural Resources Management, Institution Building, Private Sector Development, Human Resource Development, Credit and Environmental Protection. An Environmental Assessment was carried out as part of the technical analysis of the project to assure environmental soundness and compliance with recent FAA regulations regarding protection of tropical forests and biological diversity. It is also congruent with the USAID/Honduras Action Plan Agricultural Production and Export Promotion objectives. Finally, the Project fully supports Government of Honduras goals to conserve natural resources, revitalize the forestry industry and enhance lumber exports.

II. BACKGROUND

A. Country Setting

1. Economic Overview

Honduras is, by almost every economic measurement, one of the poorest countries in Latin America. In 1986, the per capita Gross Domestic Product (GDP) was calculated at $834. While this is an improvement over the $635 per capita GDP registered in 1981, it compares unfavorably with the 1986 levels registered for Costa Rica ($1,466) and neighboring Guatemala ($1,214). The country's rate of real GDP growth reached 3 percent in 1984 and held steady for 1985 and 1986 following years of negative growth in the late 1970's and early 1980's. Nevertheless, real per capita income has declined or remained stagnant every year since 1980. Inflation, which had declined steadily over the previous three years, rose slightly in 1986 to 4.4 percent -- up almost one percentage point over the 3.6 percent recorded in 1985. This increase is negligible and is mainly due to the application of a more prudent GOH monetary policy which did not permit an expansion of the money supply.

Currently, unemployment rates are estimated to be between 15 and 25 percent, while an additional 20 to 30 percent of the labor force is judged to be underemployed. While the total number of jobs has increased slightly over the last three years (1,153,000 in 1983 to 1,300,000 in 1986) the population growth (3 percent per annum) and the resultant expansion of the labor force have effectively negated employment gains.

A key factor in the persistence of the unfavorable economic conditions is the inability of export earnings to meet the demands for imports on which the country is heavily dependent. Data indicate that in 1986 the country's export earnings (FOB) totalled $900,900,000; its import bill for the same year was in excess of $978,100,000 (CIF). The Mission estimates that for every three U.S. dollars of domestic product generated, one U.S. dollar of imported commodities is required.

2. Social Overview

Honduras' poverty is also reflected in the key social indicators associated with underdevelopment. To illustrate, the human resource base is extremely weak. The literacy rate for the adult population is about 50 percent and only 20 percent of the rural population over 14 years of age is capable of reading and writing. While recent A.I.D. and other donor assistance has made progress toward remedying the deficient infrastructure of the educational system, further efforts are required to improve the quality of formal training. For example, in rural primary schools only 49 percent of first graders pass on to the second year; performance in the urban areas is only slightly better. Nationwide only 28 percent of the children entering primary school complete the sixth grade successfully. Because of unreasonably high dropout and repetition rates, it is calculated that 11 teaching years are required to produce one sixth grade graduate.

The situation is similar in the health sector where generally poor health status diminishes the productivity, earning power and quality of life of the Honduran populace. Malnutrition, particularly protein deficiencies, affects 70 percent of the population. Diarrhea, followed closely by respiratory and vector borne diseases (especially malaria), are the principal causes of mortality among all age groups. At least 45 percent of the population is without access to potable water resulting in the persistence of active disease transmission despite aggressive immunization programs. In combination, these and other factors, contribute to a comparatively high infant mortality rate (77 per 1,000 live births compared to 55 per 1,000 live births in Mexico) and a life expectancy of 57 years.

The housing conditions of Honduras likewise reflect the underdeveloped status of the country. Data for 1986 reveal a housing deficit of approximately 500,000 units. Given the current rate of population growth (3 percent per annum), Honduras should be constructing 18,000 new housing units yearly in order to satisfy the shelter needs of the population. However, construction capacity of both the private and public sector is such that only 21 percent of the new housing needs are being met, thereby creating an additional deficit

of some 14,000 units per year. Moreover, of the 512,000 units in the existing housing stock, approximately 2 percent is rendered unlivable or destroyed every year. Much of this deterioration is attributable to inadequate levels of funding for shelter maintenance and improvement.

The Government of Honduras (GOH) has taken important initial steps to overcome the country's economic difficulties and develop a new growth strategy. In 1986, the Government initiated a comprehensive economic stabilization and reform program. The monetary component of this two part program was directed toward linking immediate objectives for stabilization and growth. Implementation of this component was key to enabling Honduras to achieve a real GDP growth rate of 3 percent in 1986, contain inflation to 4.6 percent and reduce the fiscal deficit and the current account deficit in the balance of payments by approximately 2 percentage points of GDP.

The purpose of the second structural reform component of the program is to raise GDP, employment and investment in the mid-term by improving the efficiency with which the economy allocated the resources available to it. For example, one structural reform being initiated in this fiscal year, is the establishment of a career judiciary which will reduce the perceived risk of private sector investment in Honduras by providing greater assurances on the protection of human and property rights. The renegotiation of the country's publicly guaranteed, private external debt will enhance Honduras' credit worthiness vis-a-vis the international financial community. The passage of legislation designed to provide investment tax credits and tax loss carry overs will stimulate private sector investment. And, the privatization of state-owned enterprises will place such enterprises under more efficient management thereby making them more productive, while simultaneously reducing the heavy drain that the enterprises currently represent on the national treasury.

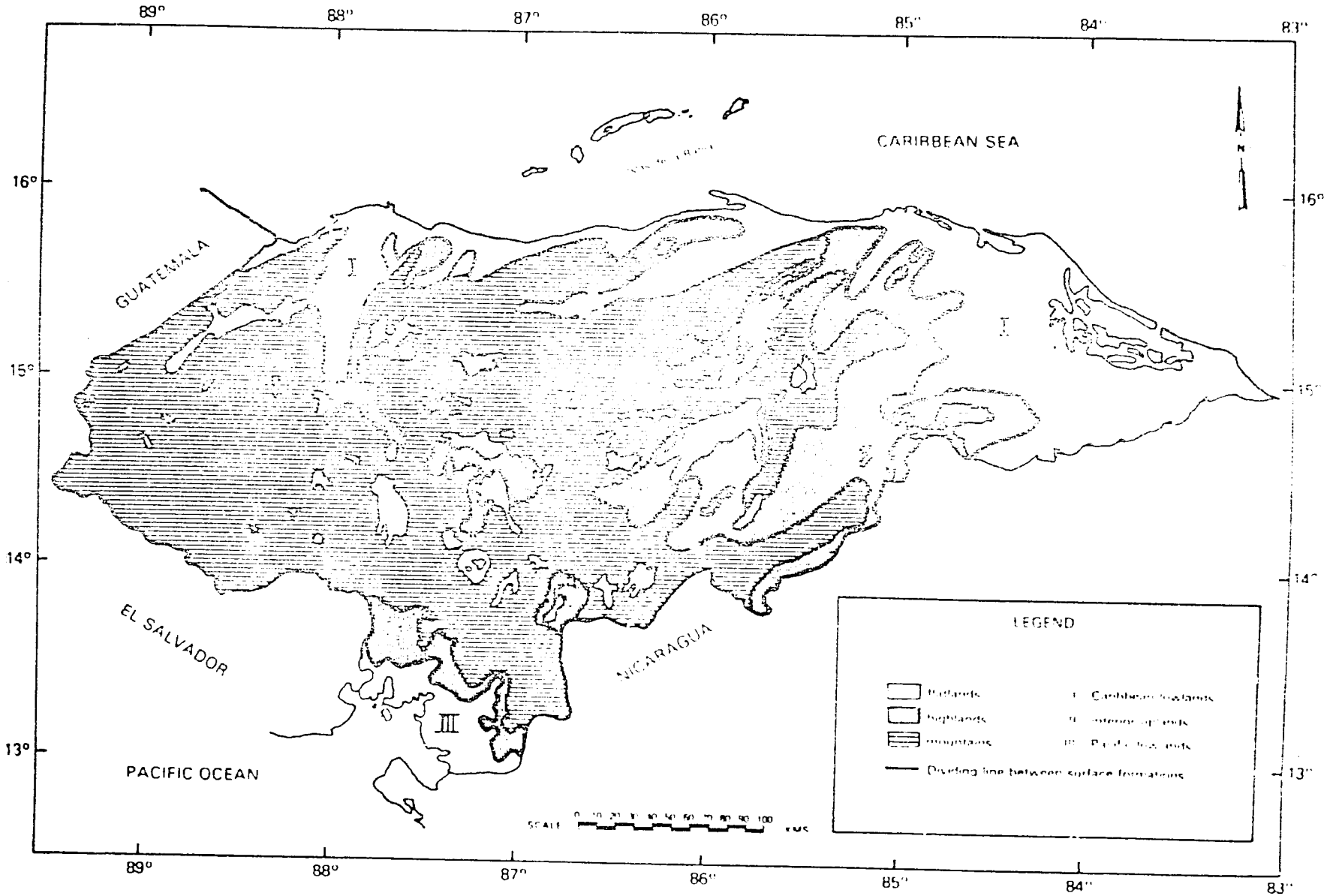
The GOH is following up on these initial, positive steps with a continuation of the two-part (monetary and structural reform) economic program for 1987 and into the future. The program will build upon the gains made to date. At the same time, the Azcona administration is moving forward with a series of initiatives, complementary to the economic program, designed to further the democratic process and broaden the participation of all social sectors in the country's economic growth. These efforts, taking place across a broad front, are designed to improve the livelihood and enhance the quality of life of the Honduran populace. However, like the economic program, they represent only the positive first steps which must be strongly supported and expanded to realize the desired objectives.

B. Agriculture and the Forestry Sector

1. The Physical Environment

Honduras is the second largest, but most mountainous country in Central America. The total land area measures more than 11.2 million hectares and 75 percent of this area contains slopes which are in excess of 25 degrees. The land forms can be distinguished into four types: interior highlands and valleys, the Carribbean lowlands, and the Pacific lowlands (see Exhibit No. 1).

Exhibit No. 1: Surface Configuration of Honduras



Source: Honduras Country Environmental Profile, a Field Study. JRB Associates, 1981. Pg. 26

The Carribbean lowlands account for 16 percent of the national territory and, along with the 20 major river valleys that connect to the three coastal plains, represent the best soils of Honduras. The fertile alluvial soils of the valleys and adjacent coastal plains are marked by large banana plantations and some sugar, pineapple and African oil palm. The Caribbean lowlands, especially the areas surrounding San Pedro Sula and La Ceiba, have surpassed the interior highlands in economic production, rate of population growth and rapidity of landscape change.

The highlands and valleys of the interior represent over 80 percent of Honduran territory. Soils tend to be rocky, thin and extremely acidic. They are dominated by pine forests and are regarded generally as extremely poor for intensive cultivation. Livestock raising has been a leading economic activity, but, until recently, little attention has been given to improve grazing practices and pasture. As a result, pasture carrying capacity is extremely low. Tobacco, coffee, grains and some fruit crops are grown on the better highland soils. The more intensive production of vegetables and sugar cane is reserved to the Comayagua and Zamorano valleys.

The Pacific lowlands encompass sparsely wooded savannas and the mangrove flood plains, the most extensive of which is the Choluteca river plain. Its principal commodities include livestock, cotton, sugar, melons and some vegetable production.

2. The Agricultural Sector

Agriculture is clearly the most important sector of the Honduran economy. In 1986, agriculture furnished almost 19 percent of the country's total GDP. In 1985, agricultural exports totalled approximately $700 million, which represented 78 percent of the country's total export earnings for that year. In 1986, the agricultural export share of total export earnings rose to 83 percent. Principal exports are the traditional commodities, viz., bananas, coffee, cattle and pine lumber. However, with support from A.I.D. and other donors, non-traditional products (e.g., fresh fruits and vegetables) are taking on increased importance.

Despite agriculture's importance and potential, the GOH has been slow to allocate sufficient resources and priority to the sector. In the 1983-86 period, a relatively small share of the total government expenditures was assigned to agricultural activities. Hence, a chronically underfunded, overly-centralized Ministry of Natural Resources (MNR) has not had the budgetary and human resources necessary to provide sufficient support services required by the sector. In 1986, there were less than 500 Government extension agents in the country, the majority of whom experienced significant periods of "downtime" (periods during which field work was impossible) for a lack of adequate logistical support and funding. The cooperative system is in disarray, and with the exception of a portion of the coffee producers, effective channels for distributing credit and other productive inputs (e.g., fertilizers, pesticides, modern technologies) are either in incipient stages of formation or are lacking. Finally, the domestic marketing of agricultural products has received little overall policy attention.

The result of these circumstances is an agricultural sector that is fragmented with respect to policy and weak in providing services to the rural farmers. It is illustrative that 95 percent of the approximately 225,000 productive units in the country are operated under one of the various forms of small scale peasant farming. The vast majority of these farmers concentrate on basic grain (corn and beans) cultivation. Production is used primarily to meet household subsistence needs, with only a minor portion of total output directed to the marketplace. The method of farming employed is, in the main, traditional and, as noted above, there is limited access to the modern factors of production that could increase output. It is not uncommon to find farm families with yearly per capita incomes of $100 or less.

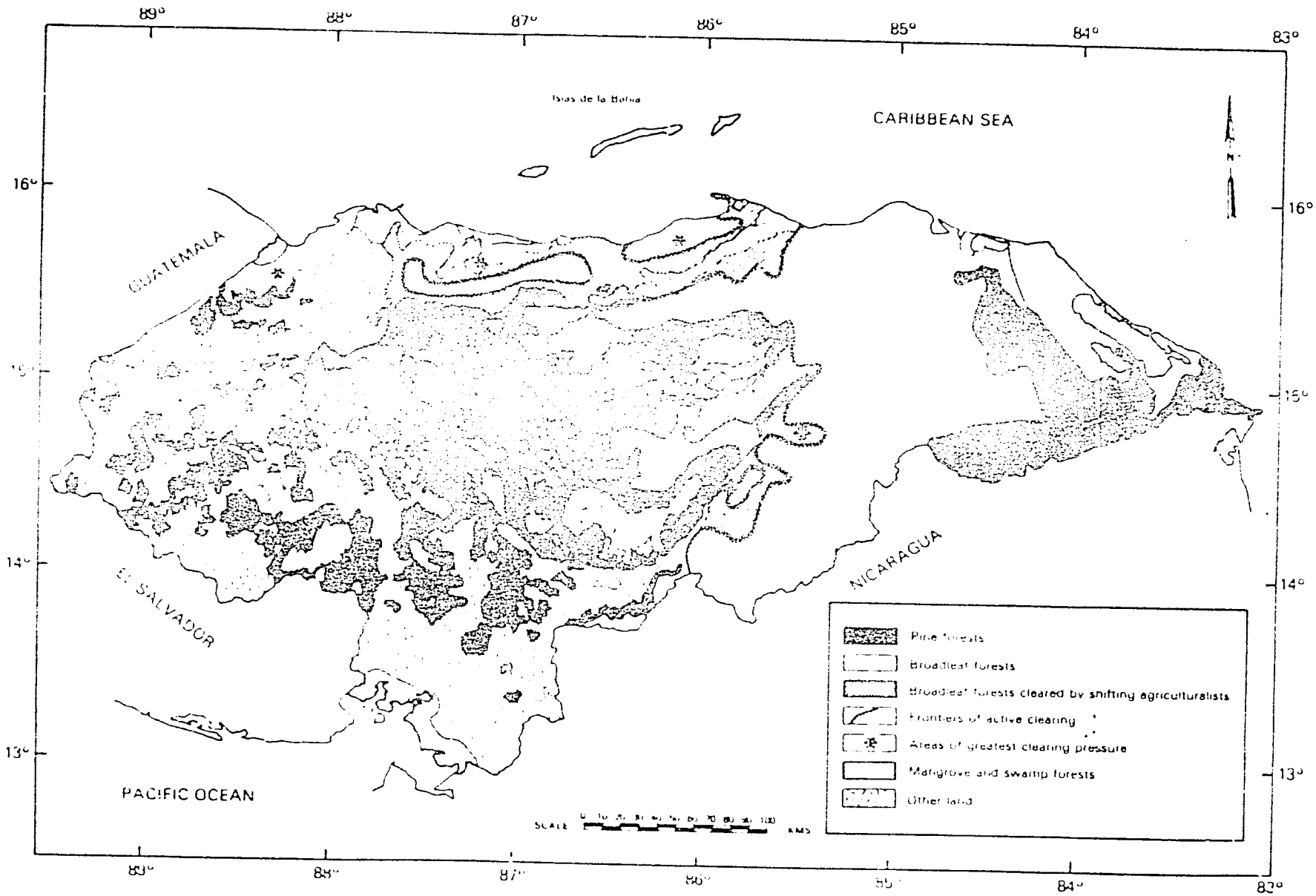
3. Forest Resources

According to available data, an estimated area of 7.4 million hectares is classified as land whose proper use should be forest, approximately 65 percent of the country's entire land area. Unfortunately only 5 million hectares are actually covered by either broadleaf or pine forests.

Current calculations place the total area of broadleaf forest at about 2 million hectares. The broadleaf forests are primarily located in the northeastern and southeastern portion of the country, especially the Departments of Atlântida, Colôn, Gracias a Dios, Olancho and El Paraîso (see Exhibit No. 2). Principal commercial species include mahogany, Spanish cedar, San Juan, sangre, maria and granadillo. All of these species are employed domestically in the manufacture of furniture and for construction. Some species, especially mahogany, cedar and granadillo (rosewood), have importance, abeit diminishing, as export commodities for markets in the United States, the Caribbean and Europe. In addition, other broadleaf species (e.g., liquidambar, tuno and mangrove) are important for the manufacture of gums, resins, tannins and pharmaceuticals which are marketed both within Honduras and abroad. Finally, oak is the preferred source of fuelwood among the Honduran populace -- especially the rural poor. It is estimated that over 5 million cubic meters per year, approximately five times that used for all commercial wood production, are consumed as fuel.

The pine forests cover an estimated 3 million hectares. They are concentrated in the central and western sectors of the country, particularly in the Departments of Francisco Morazân, Comayagua, Olancho, El Paraîso, Copân, Santa Barbara, Intibucâ and La Paz. The principal species of conifers include pitch "Ocote" pine (Pinus oocarpa), Caribbean pine (Pinus caribaea) and white pine (Pinus pseudostrobus). The wood produced from the first two of these species is similar to that of the U.S. southern yellow pine but generally heavier and more durable due to its higher resin content and slower growth. Major export markets for Honduran pine wood are the Caribbean, and Europe. Although all of these species are used as a wood resource, Pinus oocarpa covers the largest area, has the highest volume and is the major source of pine wood produced in the country.

Exhibit No. 2: Forest Map of Honduras



Source: Honduras Country Environmental Profile, a Field Study. JRB Associates, 1981. Pg. 75

EXHIBIT 2

Approximately 120 sawmills operate in Honduras; this number has remained fairly constant since 1976. Thirteen sawmills, belonging to seven companies, account for over 50 percent of the production. Almost all the lumber produced is pine lumber; hardwood represents less than 2 percent. In 1985 Honduras' lumber industry produced 179 million board feet of lumber which generated approximately $160 million to the Gross Domestic Product (GDP).

Many of the sawmills have very low production levels. In 1985, the 59 least productive sawmills accounted for only 12 percent while the top 13 sawmills produced over 50 percent of the total production. According to COHDEFOR's annual statistical summary, the sawmills can be grouped by production levels as follows:

Exhibit No. 3

SAWMILL PRODUCTION LEVELS IN 1985

PRODUCTION LEVEL Million of Board Feet	NUMBERS OF SAWMILLS	PERCENT OF SAWMILLS	TOTAL PRODUCTION Million of Board Feet	PERCENT OF PRODUCTION
Less than 1	59	53	21.4	12
1.0 - 1.9	26	23	34.2	19
2.0 - 2.9	13	12	30.2	17
3.0 - 5.9	8	7	34.5	19
6.0 - 11.9	3	3	26.6	15
12 and over	2	2	31.7	18
TOTAL	111	100	178.6	100

The proportion of lumber produced on band and frame sawmills has increased steadily over the last few years. In 1982 they accounted for 50 percent of the country's production, while in 1985 it had risen to 60 percent, with circular saws producing the remaining 40 percent.

The other primary wood industries are quite small. In 1985, the two plywood plants in the country produced 3 million board feet of plywood and the three naval store plants in operation produced 6 million pounds of resin and 300,000 gallons of turpentine.

Half of the country's lumber production is utilized domestically for contruction and by the secondary wood industry. In 1985, these secondary industries exported the equivalent of 20 million board feet of wood products. Broom handles and stakes for tomatoes accounted for half of the volume.

The other half of the lumber production is exported, with Trinidad and the Canary Islands accounting for over 50 percent of the market. In 1985, lumber accounted for $34 million and secondary wood products for $10 million in Honduran exports. The total of $44 million represented 4.9 percent of the

exports for that year, placing wood products fourth, behind bananas, coffee, and metals, as a generator of hard currency. The total labor force in wood industry, both primary and secondary, is about 30,000.

4. Management of Forest Resources

The Honduran Forest Development Corporation (COHDEFOR) is the principal public sector institution charged with the responsibility of forest management and conservation. COHDEFOR is headed by a general manager who has budgetary, administrative and programatic authority within the institution. The General Manager responds to a Board of Directors composed of representatives of various line Ministries, the National Agrarian Institute (INA), the Lumberman's Association of Honduras (AMADHO), wood products manufacturers, and rural organizations and cooperatives. The General Manager is assisted by a seven-member Executive Committee which oversees the functions of COHDEFOR's Commercialization, Training, Planning, Forestry and Administration Departments, sets prices for domestic and export sale of lumber and provides guidance on the implementation of the Social Forestry Program.

Functionally COHDEFOR operates, at the national level, through a central office, located in Tegucigalpa and nine forest regions (see Exhibit No. 4). Each forest district has several Integrated Forest Management Unit offices under its supervision.

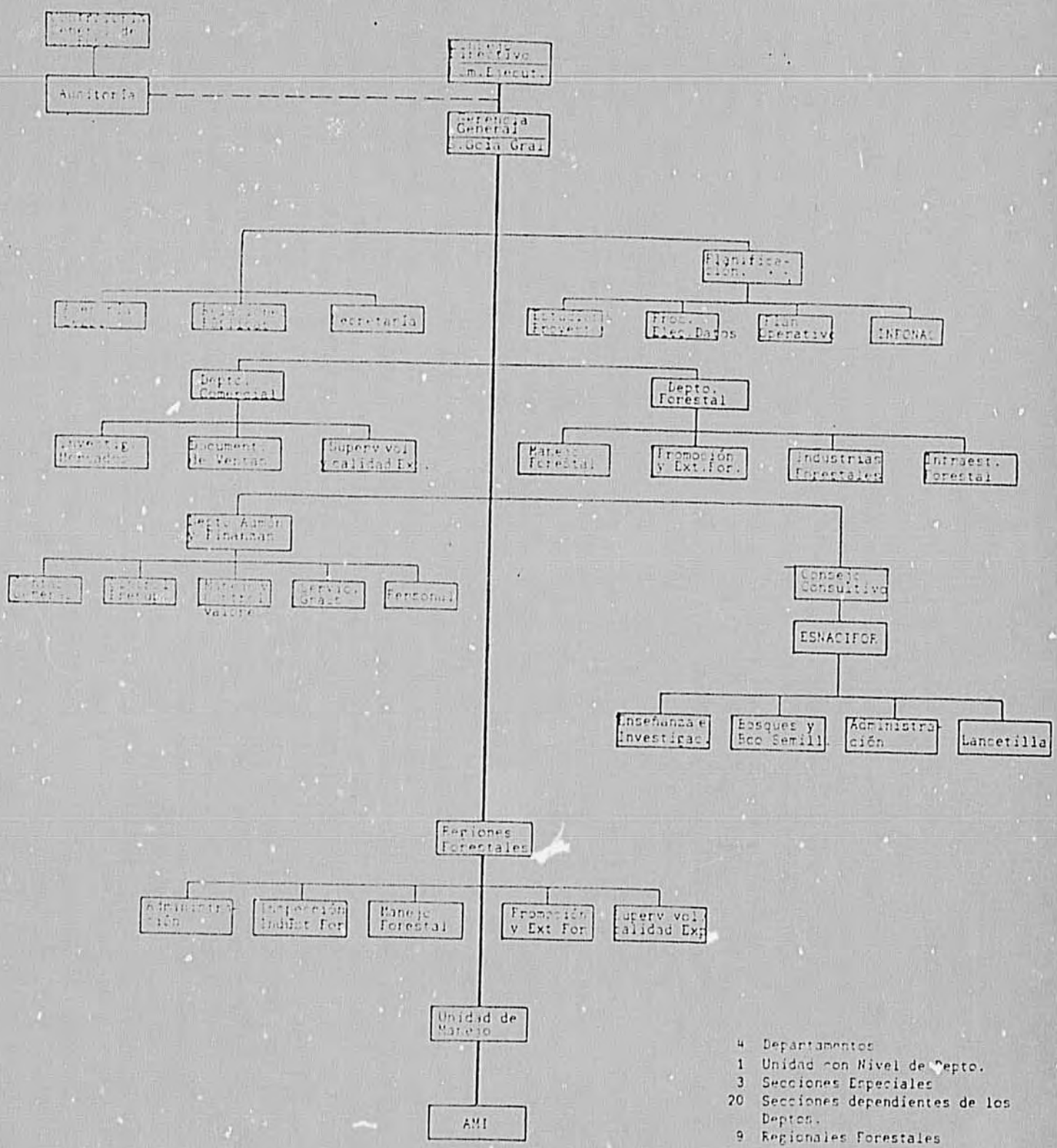
The Central Offices Division performs staff and administrative support functions. For example, the Forestry Department coordinates all activities, including liasion with other donors, on matters concerning forest management. The Planning Division, as the title suggests, develops strategies for forest management interventions on a nation-wide basis. Public relations focuses on relationships with the Honduran press and the preparation of publications on proper forest management.

The nine forest regions are the operational arm of COHDEFOR, directly responsible for managing, conserving and protecting the forest, as well as overseeing the exploitation and commercialization of the same resources. They carry out COHDEFOR's policies and strategies as set forth in its funding legislation, its regulations and resolutions by the Board of Directors. The National Forestry School (ESNACIFOR), is also a part of the field operations. ESNACIFOR trains forest technicians at an associate degree level, carries out silviculture related research and experimentation and maintains the Lancetilla Botanical Experimental Station on the north coast. In addition, COHDEFOR maintains two offices located on the north and south coasts for inspecting and regulating lumber yard management and shipping.

C. Problem Statement

The country's forest reserves are declining rapidly. In 1964, it was estimated that there were over 4 million hectares of broadleaf forest. An inventory carried out in 1980 revealed that the area had been reduced by half to slightly more than 2 million hectares. The current rate of clearing is

Exhibit No. 4: Functional and Organizational Structure of COHDEFOR



4 Departamentos
1 Unidad con Nivel de Depto.
3 Secciones Especiales
20 Secciones dependientes de los Deptos.
9 Regionales Forestales

calculated at over 80,000 hectares each year, the equivalent of a depletion rate of 4 percent per annum. If this pace continues, the last remaining broadleaf forest will disappear within 25 years.

The area of pine forest has not diminished appreciably since 1964. However, these forests are being degraded so that the volume of standing timber has declined from 48 million cubic meters in the early 1960's to about 28 million cubic meters in 1980. If this rate of decline is not arrested, and the trend reversed, remaining mature pine stands will be exhausted in 18 years.

There are multiple reasons for this alarming decline in the productivity of the forest. In the hardwood forest, slash and burn agriculture is the most prevalent problem. Approximately 200,000 families, or one-third of the population of Honduras, live on land categorized as forest land. More than 60 percent of their income is earned through slash and burn practices from the cultivation of corn and beans. The economic activities of this group have a direct, detrimental impact on the forests; they remove approximately four to five times more forest cover each year than commercial logging operations and change the land use activity to one which virtually precludes natural regeneration of the forest.

In the pine forest, where the project will focus its efforts, the main causes for depletion are wildfires, uncontrolled grazing in the forest, poor logging techniques and the demand for firewood.

Uncontrolled fires sweep through thousands of hectares of pine forest during the dry season each year. Although most are ground fires that do not seriously damage mature trees, the fires destroy seedlings and young trees. Repeated fires result in degraded stands or eventually in areas without trees, because regeneration cannot develop. Since those living in the forest, especially the pine forests, do not perceive any incentive to manage it properly, they tend to use fire inappropriately. Fire is used to prepare new fields for cultivation and such fires often escape to surrounding forest land.

Although grazing cattle in a pine forest can be a productive source of income, the traditional extensive ranching practice of annual burning in order to maintain the palatability of grass and to control pests of livestock also destroys the pine regeneration. For the rancher the forest is a disturbance.

Destructive logging practices such as high grading, neglecting to leave adequate seed trees, damage of the residual trees, and poor location of roads and skid trails cause conditions that inhibit the regeneration of the site after harvest. Since the best opportunities for regeneration occur immediately after logging, when the tops of trees provide ample seed and grass cover is still sparse, fires at that time are particularly damaging.

In the vicinity of towns the demand for firewood and its uncontrolled exploitation causes serious degradation of the forest. Treeless rings around many of the large towns are testimony to this pressure on the forest. Frequently, potential sawtimber is cut for fuelwood which brings only a fraction of the potential revenue.

The environmental consequences of improper forestry and land management are many and are well described in the Honduras Country Environmental Profile. Perhaps the

most serious are soil erosion and downstream impacts; degradation of water resources; and the loss of the forest resource and biological diversity.

Honduras' pine lumber production has declined yearly from 1978 to 1986. It has dropped from 261 million board feet in 1978 to 165 million in 1986, a 37 percent decrease, with a parallel decrease in revenues. Of course this decline also has a negative effect on the country's employment situation, because forest industry is particularly labor intensive. Logging costs are continuously rising because the more easily accessible areas have been the first to be harvested. The insecure investment climate prevailing in the forestry sector has been a deterrent to expansion and modernization of the industry, with the result that it is working with deteriorated and obsolete equipment which limits its productivity, efficiency and alternatives of utilization.

In sum, if the present trend continues:

- In less than a generation, Honduran forests will be depleted to a point where they will not sustain commercial forest industries, leaving thousands of families without employment and causing hardships to the entire economy in which wood plays a major role.

- In less than two generations, at current rates of depletion, the forest cover of Honduras will be virtually eliminated. Consequent flooding in the valleys and alluvial plains, already serious, will be beyond the capacity of Honduras to manage with its own financial resources and environmental damage will be irreversible.

D. Constraints

The constraints to solving the forestry sector problems in Honduras fall into five categories. First, changes in the policy environment are required to realize a more efficient and sustainable use of the forest resources. Second, there are institutional constraints within COHDEFOR which limit their ability to implement a forest management program. The third type is a set of technical constraints which the private sector sawmillers must overcome to upgrade the quality and environmental soundness of their operations. The fourth set of constraints are financial matters which inhibit COHDEFOR's ability to sustain a long-term (beyond the life of the project) forest management effort and which inhibit the private lumber processors from upgrading their mills. The fifth category of constraints are those facing the small farmers: the need to adapt to new farming practices and the limited access to technical assistance and other critical inputs to successfully utilize the new practices once they are adopted.

1. Policy Constraints

The most important policy constraint in the forestry sector is the present system of timber sales and stumpage valuation.* Under the current system, all

* Stumpage is standing timber as it is found in the woods. The term timber is used here to identify that part of the forest inventory which is available for harvesting. The purpose of stumpage appraisal is to estimate the value of the standing timber to be harvested on a particular area at a particular time.

trees on public and private land are sold at the identical price of L12 per cubic meter, regardless of location, quality, accessibility, volume per area and other factors which might affect their true economic value. Furthermore, under the present system, the volume measured as harvested corresponds only to the material removed from the woods as indicated by truck invoices. This practice encourages the removal of only the best logs and causes substantial waste because usable logs and standing trees of inferior quality are left in the forest.

A second policy area in need of attention is the system for allocating logging permits and control of forest management practices. Under current arrangements, determinations concerning which areas of the forest to cut and which private firms will be awarded logging concessions are made on a administrative basis by COHDEFOR's General Manager upon the recommendations of their technical staff. The drawbacks to this system are legion. At one level, it places an unreasonable degree of power in the hands of COHDEFOR personnel - a condition which raises the potential for favoritism, and the unequitable allocation of logging permits. Simultaneously, the system is a divisive factor among the private sector loggers. It obliges them to compete for concessions through personal relationships or political strategies rather than on the basis of objective technical capacity and cost criteria. In turn, such competition breeds mistrust and accusations of patronage. COHDEFOR's efforts to regulate forest management, conserve the forest resource and present environmental degradation have been insufficient. By strengthening COHDEFOR's role, more time and resources will be available to resource management and protection needs.

2. Institutional Constraints

A series of institutional constraints revolves around COHDEFOR's outdated personnel, organizational and financial management systems. COHDEFOR has in the past developed personnel manuals and procedures. However, they have fallen into disuse, and currently, there is no uniform system used to recruit and place personnel. Job descriptions, which detail the responsibilities of a particular position, and how that job relates to other positions in the same work area, are the exception, not the rule. Formal recruitment procedures, including qualifications statements and advertising to achieve healthy competition for employment, are not always applied. Standards and guidelines for career progression (e.g., employee performance evaluations, tenure requirements) are used haphazardly, and there is not a consistent application of procedures for selecting out non-performers.

Financial management is likewise in need of considerable strengthening. Procedures must be developed for establishing budgets on the basis of realistic income projections rather than on the estimates of operating unit needs. Similarly, systems that govern the disbursement of monies to discrete divisions for operating expenses require serious revision as do the procedures used for tracking expenditures. As COHDEFOR moves from direct involvement in

lumber marketing to supervision of the process, accounting methods must be put in place to track both the commissions due them as well as the taxes owed to the Central Government for lumber export transactions.

A final management area in need of attention concerns general operating procedures. The Corporation is in the throes of organizational restructuring. Accordingly, the functional task of the various divisions and offices, while generally established, have yet to be finalized. As a result, there is some confusion concerning responsibilities of discrete management units, the interrelationships among the units and the levels of authority within and between units. In turn, the confusion contributes to unduly long delays in initiating and terminating administrative actions.

3. Technical Constraints

The logging operations and sawmills of Honduras are in physically poor condition. Past circumstances (viz., the insecure wood supply, COHDEFOR domination of the milling business) have discouraged the modernization of equipment and reduced the investment in maintenance and spare parts. While the recent policy changes have improved the climate for private sector participation, a general dearth of knowledge among the operators concerning alternative technologies is a constraint to improving lumber milling efficiency. Inadequate maintenance of logging and sawmill equipment causes excessive down time and increases costs. Many of the operators are not sufficiently familiar with more efficient operations in other countries and technical capabilities to plan and carry out sound forest management and environmental protection measures are not sufficient. This deficient knowledge is especially apparent and serious with respect to utilizing small sawlogs. Currently these small logs make up a large fraction of the enormous waste that is left in the woods. It has been estimated that if the present 30 cm top diameter limit were reduced to 15 cm and logs with no clear faces but otherwise without defect were removed, the life of the present sawmill industry could be almost doubled without reducing the present level of lumber output. Such improvements in utilization would require the modification of sawmills, for which the expertise is currently inadequate.

The industry has been slow to implement quality control. Losses due to unacceptable quality are taken as an accepted part of the normal production process when in reality many of them could easily be eliminated. An acute example of easily avoided losses is the waste caused by improper drying and handling of lumber, which results in fungus attack, warping of boards, excessive trimming of lengths, unnecessary inventories and other deficiencies which reduce profits.

Improvement cannot be achieved without upgrading the skills of the workers. However, traditionally the forest industry worker learns on the job and has no access to formal programs of instruction in the skills needed to improve efficiency.

4. Financial Constraints

Financial constraints affect both COHDEFOR and the private sawmillers. Since 1979, COHDEFOR's financial picture has been marked by a substantial decline in revenues and a significant increase in debt. To illustrate, between 1979 and 1982, revenues decreased by 82 percent while liabilities rose by 254 percent. Investments made by

the Corporation in its subsidiary companies (CORFINO, SEMSA, LOCOMAPA, FIAFSA, CASISA, PROHMASA, International Wood Products and Resinas de Honduras) are the principal cause for its poor financial situation. As of October 1986, approximately 80 percent of COHDEFOR's total assets (valued at $675 million) consisted of investments made in subsidiary companies. Over 70 percent of the Corporation's risk in its subsidiaries consist of investments in company shares; the remainder includes direct and indirect loans. With the possible exception of CORFINO, every one of the subsidiaries has accumulated financial losses that have completely absorbed their equity. In the aggregate, they represent a significant drain on the Corporation's resources. COHDEFOR has already written off $9.5 million in the value of the shares held in various subsidiaries and has written off $27 million in bad loans. Currently, only four of the companies are operating. Three have been closed down and one was never able to begin operations.

With respect to the private sector, the large lumber wholesale firms in Honduras are diversified, financially solvent companies. In many cases, they are vertically integrated operations combining several wood processing functions. These firms, or their principal owners: (1) are major shareholders in local banks (e.g., Honpipi, Lamas); (2) are local branches of multinational lumber marketing companies (e.g., Robinson Lumber Company, Westdan Lumber Company); or (3) have well-established linkages with local banks (e.g., Sansone) or with foreign lumber importers who pay for their lumber purchases in advance. In virtually all cases, these companies do not require financing.

The weaker element in the private forest industry sector is represented by independent loggers, medium and small sawmills. Independent loggers, commonly referred to as "field contractors", have their own fleets of tractors and trucks, and field crews. They work under agreements with sawmills to harvest trees in the areas assigned by COHDEFOR. Many medium and small circular sawmills, "square" logs for delivery to larger, more sophisticated operations. To finance their operations, they receive advance payments from the larger sawmill owners. These advances are generally granted speedily, based on the personal relationship existing between the parties and the fact that they do not entail large sums of money. Because of the expediency of this type of financing, many of the smaller second-level mills resort to these sources to solve their critical operating capital needs. Interest rates for these advances have been observed to range from zero to 19 percent. In all cases, however, the logger or sawmill operator is expected to deliver most of his log or lumber output to the financier. In many cases, prices paid by the financiers are lower than those prevailing in the market.

Only a handful of the sawmills and loggers have access to commercial bank credit. Loans from private banks to these operators are restricted to well-known clients who can offer sufficient urban real state or other assets as collateral. However, even in these cases, private forest operators receive loans at annual interest rates of 19 percent and for periods no longer than two years. Naturally, under these conditions, not even these operators can engage in major investments.

5. Social Constraint

Previously, it was noted that the slash and burn agricultural techniques of peasant farmers are one of the principal causes of forest land loss. While these practices are ecologically destructive and counterproductive to the long-term economic well-being of the country, they are a product of small farmer adaptation to an unfavorable social and economic milieu. Historically, campesinos have not had access to the technologies required to practice sustainable intensive cultivation on a profitable basis. Financial constraints and traditional isolation from the social mainstream have obliged farmers to employ the unsophisticated slash and burn method to subsist. Although the returns from such farming are extremely limited, they do enable the campesinos to survive where no alternative is readily available to them. The introduction of ecologically appropriate and economically more profitable methods of hillside agriculture will entail a significant behavioral change. Farmers will have to take leave of survival technologies which have been tried and proven, for methods whose efficiencies are to them unknown. Small producer reluctance to adopt new technologies, because of the risk that such modification entails, is the cultural constraint which project inputs must overcome.

E. GOH Forestry Development Strategy

The Government of Honduras' objectives for the forestry sector are:

-- to assure the sustained flow of products from the forest while increasing its productivity and incorporating the rural population in the benefits; and

-- to increase the value of forest product exports.

To achieve these objectives, the GOH has formulated a two-part strategy. The first part of this strategy is to augment the capability of COHDEFOR to manage the resource and guarantee that utilization of the forest is carried out in a rational manner. To this end, the focus of COHDEFOR has been altered. COHDEFOR has relinquished much of its prior responsibility in forest industries and marketing to concentrate on the management of the forest resources. COHDEFOR has elaborated a document that indicates the policy, strategy and main actions it plans to carry out from 1986 to 1990.*

The organization and budget of COHDEFOR is being adjusted according to the new orientation of the institution. Consequently, the regional offices of COHDEFOR have been given greater authority and now depend directly on the Office of the General Manager. In response to greater involvement of the private sector in export of lumber, the functions of the Commercial Department have been changed to emphasize control and documentation, rather than direct marketing as was formerly their responsibility.

*Políticas, Medidas y Estrategias y Acciones Prioritarias a Ejecutarse en el Período, COHDEFOR (1986-1990)

To incorporate the rural population into forestry activities, the centerpiece of the strategy is the delimitation of forest areas into Integrated Management Areas (AMIs). The protection, management and utilization (including logging) in these areas of between 1,000 and 5,000 hectares will be carried out by the local community with the guidance of COHDEFOR technicians. By 1990, 450 of these AMIs are supposed to be functioning.

The second part of the GOH strategy centers on revitalizing the forest industry through a significantly enhanced participation of the private sector in production and export. The National Development Plan forsees a 4.9 percent annual growth rate for the forestry industry sector, due primarily to increased efficiency of the primary and secondary industries.

The first step in implementing this portion of the strategy was taken with the adoption by the GOH of several policy measures in 1985. Principal among these were decisions to pass to the private sector complete responsibility for timber processing (i.e., logging and milling) and marketing. This transition requires the divestiture of COHDEFOR owned forest industries, a process which has already begun and which will continue for the next several years. The new strategy also requires that COHDEFOR give up the direct export of lumber and encourage competition among private sector firms to export. Important advances have been made on this task, and an improved system is functioning. However, this system still needs to be refined.

III. Project Description

A. Project Goal

The project goal is to optimize the value of agricultural production through sustainable yields in production and exports derived from the forest sector in the immediate future while, at the same time, creating the conditions that will generate a more productive future forest.

B. Project Purpose

The project purpose is to improve the management and sustainable productivity of commercial pine forests and the efficiency of industrial conversion and marketing of wood products. The achievement of this purpose is dependent upon the accuracy of a series of assumptions. The most important of these is the willingness of the GOH to further the implementation of policies to enhance private sector participation in forest management and in forest products marketing. Critical ancillary assumptions include: (1) a continuation of the democratic process in Honduras, (2) a continuation of favorable international prices for lumber and secondary wood products, and (3) administrative stability within COHDEFOR.

C. Project Components

The project consists of three principal components: (1) institutional reorientation of COHDEFOR, (2) forest management in selected areas; and (3) strengthening of private sector forest industry. This section of the

paper contains a description of these components and how they will help overcome the constraints described in order to achieve the project purpose.

1. Institutional Reorientation of COHDEFOR

It has already been described how COHDEFOR has gone through profound changes during the last two years. By turning marketing over to the private sector and by divesting itself of its forest industries, the Corporation is now in a position to focus on management of the forest resources as its primary concern. The project will assist COHDEFOR in carrying out its new emphasis. The project will thus help this public sector institution encourage private sector participation in those areas where it is appropriate, specifically production and export marketing of lumber, while concentrating COHDEFOR's own efforts on management of the forest resource on which forest industry and environmental well-being depend.

a. Activities

i) Stumpage Sale and Valuation System.

Perhaps the most important innovation of the project, and one which will have fundamental implications on all components, is the change in the practice of selling timber. Over a two-year period, the project will develop and phase in a uniform system of selling timber on the stump. This implies that the volume of wood standing in a specific tract of forest must be estimated using well known forest inventory techniques, since this volume will be used to determine the sale value of the tract. Guidelines for carrying out the inventories and computations will be developed and field crews will be equipped and trained to do the work. The project will develop environmentally sound regulations and model contracts which COHDEFOR will use to sell the standing timber to private loggers, and will implement a system of inspection and control to assure that conditions of the contract are met. These regulations and controls will include basic environmental assessment and the implementation of environmental protection and mitigation measures. Although initially, a uniform price of standing wood per cubic meter will be used, studies will be carried out in order to set prices which reflect the true value of the tree, depending on its location, access, size and other factors. The use of these variable prices will be initiated throughout Honduras by the third year of the project. Implementation of this method of selling and pricing timber on the stump will require that COHDEFOR not only train its own personnel but also educate and convince forest industrialists in the new system.

The sale of standing timber and the use of variable prices have long been suggested by donor agencies and Honduran foresters. The primary advantage of these new procedures is the more efficient utilization of the trees cut, leaving a lower amount of usable wood in the forest and thereby stretching out the forest resources. This system will also provide an incentive for the utilization of forest residues in the mill. Without the implementation of this new system, there is little hope for the sustainability of the pine forest and, consequently, the wood based industry of Honduras.

To achieve these activities the project will provide long-term ex-patriot technical assistance in timber management logging and timber sales. Short-term consultants in lumber manufacture, forest economics, environmental protection and computer software will also be provided. The project will finance training, technical staff, 11 timber sale crews and the equipment and vehicles for them. The logging specialist will assist in the design of the forest road/trails and logging aspects of the management plan and will be responsible for developing, in cooperation with COHDEFOR, the technical/environmental guidelines and regulations to be used in logging contracts.

ii) Lumber Export Regulation

COHDEFOR no longer does any direct marketing of lumber and is no longer involved in actual sales. However, in order to comply with the law (Decree 103), COHDEFOR remains the exporter of record. The principal objective of COHDEFOR in the context of marketing, is to ensure that Honduras receives the maximum financial benefit from the lumber that can be produced for export from the resource available. This can be expanded into the following terms of reference:

- Facilitate the export of lumber done by the private sector.
- Supervise and confirm volumes and qualities for every shipment.
- Establish the appropriate level of income to COHDEFOR from private sector exports.
- Maintain detailed records of activity.

In summary, it is believed that, even though COHDEFOR is no longer directly marketing, there are a number of responsibilities and actions that the Commercial Department of the Corporation must undertake. These are essentially in the following areas:

- Documentation
- Quality and quantity supervision
- Market analysis

The project will help COHDEFOR's Commercial Department (CD) increase its efficiency in these three areas.

The first and perhaps most important activity on a day-to-day basis is to implement and facilitate the documentation required for each shipment. The Documentation Section of the CD will implement all necessary documentation for shipments and will maintain continuous and up-to-date information on shipments by exports, country and specification. The emphasis will be on acting as a facilitator in support of the exporter to secure rapid processing of documentation while, of course, verifying that contract terms (e.g., quantities, specifications, prices) are met. This approach will be a marked contrast to the past where the exporter often was placed in the position of a supplicant, seeking from COHDEFOR and other government agencies, the various permits required to export -- a process that was time consuming for the exporter and contributed to strained relations between the exporters and the public sector, especially COHDEFOR.

The efficiency of the quantity and quality supervison will be increased in order: (1) to confirm that the volumes and quantities declared by the exporters are valid; and (2) to ensure that agreed upon quality standards are maintained. This volume and quality control function is needed to maintain the reputation of Honduras as a supplier and will be carried out through spot checking. A few shipments of poor quality by an irresponsible exporter can seriously damage this reputation. This control is also needed in order to assure that Honduras receives the foreign exchange that corresponds to this type of transaction. Specifically, the tasks of the Supervision of Quality and Quantity Section of the CD are the following:

- To obtain an accurate count of the volumes of each specification shipped on a vessel;
- To ensure that the agreed standards of packaging are maintained;
- To spot check on a random sample basis the quality of product due to be shipped, to confirm this is in accordance with the standards established for the destination involved;
- To provide to the Documentation Section all the necessary information on volume and quality.

A final task of the Commercialization Department, through its Market Analysis Section which will probably consist of one individual, will be to maintain detailed knowledge of what is happening in the world-wide lumber market in terms of demand and competing supply, in order to assure that the export prices received for Honduran lumber are in in accordance with the market. Another reason to keep up with market information is to enable the exporters and COHDEFOR to react to market changes and maintain the competetive edge of the private sector.

The project will also support producers by financing activities that benefit the industry in general. Specifically it will assist AMADHO in periodically carrying out or subcontracting specific market studies aimed at diversification of present sawmill production and the development of the Central American Market. Also the project will provide funding to AMADHO so that it can design and implement a promotional campaign emphasizing the merits of Honduran pine, and to maintain statistics of the Honduran wood products industry. The assignment of a project financed advisor to AMADHO will facilitate these activities and encourage this Association to play a more active technical role in support of the wood industry.

As inputs, the project will finance four short-term consultants in various specialties related to lumber export, as well as trips to foreign markets. In addition it will provide funds to AMADHO to contract one local long-term technical advisor to do various studies and promotional publications, and to acquire a vehicle and a PC computer.

iii) COHDEFOR Managerial Efficiency

The project will finance a package of activities to overcome the management constraints which impede the Corporation from functioning more efficiently.

COHDEFOR's Department of Management and Finance will be tasked with carrying out these activities.

As a semi-autonomous organization, COHDEFOR must generate the income required to sustain operations. As discussed in the Constraints Section of this paper, a major cause of the Corporation's unhealthy financial situation are the losses incurred by its subsidiary industries. The full enactment of the 1985 policy decision to privatize will improve COHDEFOR's financial picture (to date, two of seven COHDEFOR subsidiaries - FIAFSA and SEMSA - have been leased and LOCOMAPA and CASISA have been put on the market). However, the Corporation must revamp and upgrade its financial management procedures to achieve self-sufficiency. To this end, the project will analyze historical data on income generated through timber sales to establish a trend line for past revenues. In addition, new systems will be developed for setting and collecting fees for timber sales and commissions for lumber sales -- the two principal sources of income for the future. Projections on the income to be earned in the future will be made and used, together with the data on historial trends, to calculate budgets that coincide with real revenue projections. The anticipated income streams will be calculated on a yearly basis. Once set, expenditure items will be prioritized. Those items or activities which are beyond the reach of available funds will either be postponed or completely eliminated. Finally, systems will be developed for affecting disbursements to discrete staff and line offices as well as for tracking expenditures.

The starting point for improving the internal operating procedures will be to finalize the reorganization process initiated early in 1986. Project financed management specialists will review the new structure and propose functional responsibilities for each of the Corporation's units. This task will also entail defining the relationships among offices and establishing clear lines of authority and responsibility. Special attention will be given to formulating the processes that will govern the interchange of both COHDEFOR and the private sector. It will be extremely important to develop simple, clear and agile procedures for requesting and obtaining lumber export permits. It will be equally important to design an equitable, efficient system for awarding logging concessions. Finally, manuals governing logistical support activities, (e.g., procurement of commodities and technical services, control of vehicles and supplies) will also be updated. A management information system will be developed and a library will be established to compliment the operational efficiencies that will be achieved through application of revised procedures.

Project inputs to support the Administration and Finance Department in developing this plan and making it operational will include long-term T.A. in public administration and short-term T.A. in financial management. The training provided will be specialized short course instruction in personnel management, finance, accounting and management systems.

Project inputs will also be utilized to upgrade ESNACIFOR's capacity to provide the project's training by financing the purchase of specific laboratory and field equipment.

2. Forest Management of Selected Areas

a. Project Areas

Forest management activities of the project will be a pilot effort in two pine forest areas, La Union in the Department of Olancho and a second site that will be initiated in year four of implementation. A third site will be selected in the last year of the project, but other than for preparation of a forest management plan, no funding will be included in the project to develop the third zone. Throughout the process, the technologies employed will be evaluated and modified where necessary. It is anticipated that by the end of the project, a methodology for efficiently managing forest resources will have been developed and institutionalized for replication throughout the country.

The first area, La Unión, is located in the northwest corner of the Department of Olancho approximately 110 kilometers northeast of Tegucigalpa in the central portion of the country. The area is located entirely within the Upper Aguan River Basin. It includes the municipalities of La Unión, Mangulile, El Rosario and Yocon (see Exhibit No. 5). The La Unión Forest Management Unit is approximately 100,000 hectares in size of which 50,000 hectares are pine forest (Pinus oocarpa and Pinus caribaea), and 20,000 hectares are broadleaf forest consisting of virgin and mature timber. According to COHDEFOR's present data, it contains a total estimated commercial pine volume of 4.6 million cubic meters.

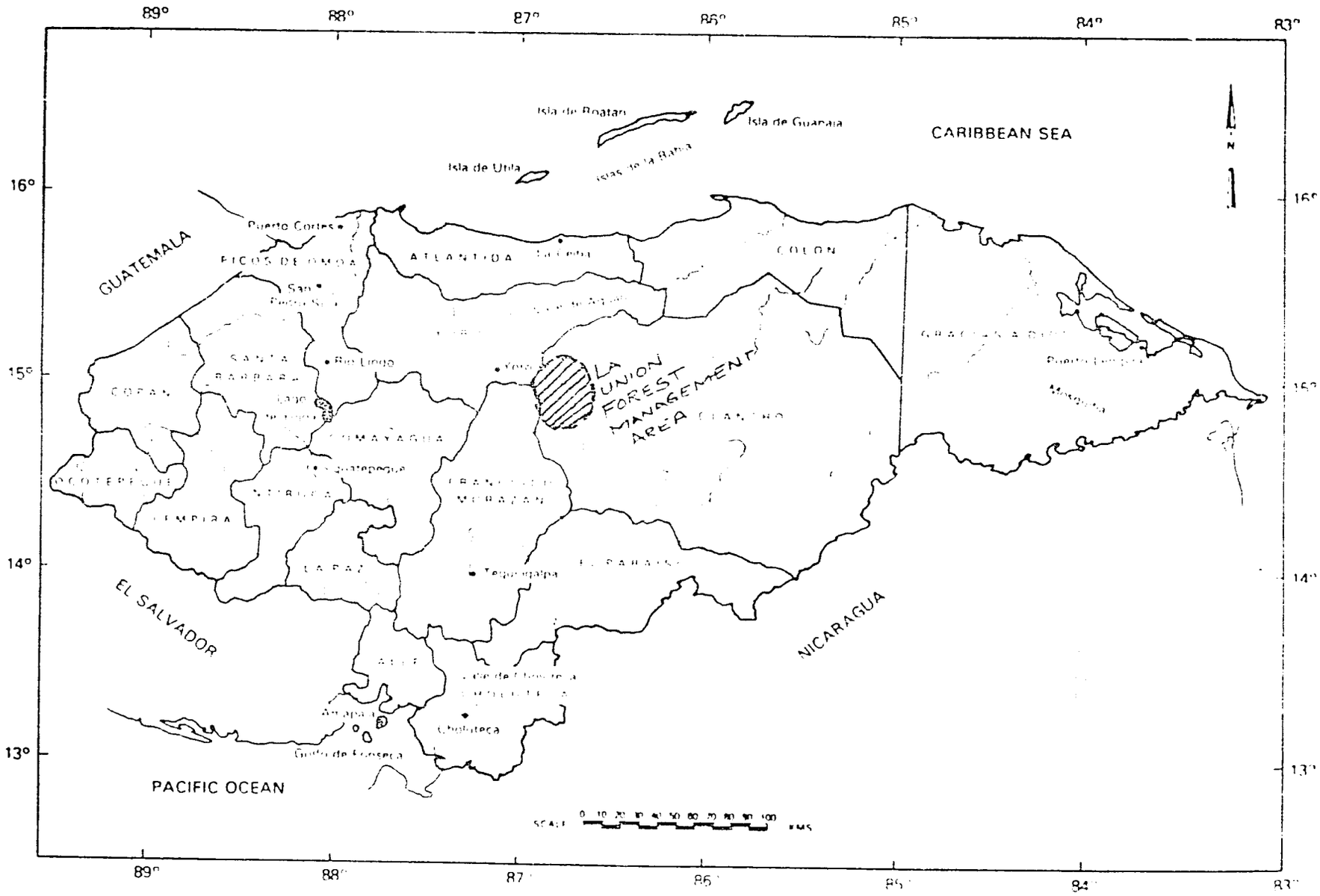
The area's relief is characterized by steep gradients; an estimated 75 percent of the project area has gradients of over 30 percent. Intermountain valleys with more favorable relief are few and small in size. The altitude of the project area ranges from 600 to over 2,000 meters above sea level. The area is dominated by four major soil series -- two are sedimentary (Chandala and Sulaco) and two are metamorphic in origin (Jacaleapa and Danlí). All four have high erosion potential and require strict erosion control practices.

Five Life Zones and two Transitional Zones are known to occur within the project area (Holdridge Life Zone System).* The driest and hottest ecological zone of the area is the Tropical Dry Forest Life Zone which occurs at low elevations (below 700 m.a.s.l.) along the Yaguala River from Yocon to Mangulile. The wettest and coolest conditions of the area occur in the Lower Montane Wet Subtropical Life Zone along the divide northeast of La Unión. More detailed information on the physical and biological resources of the area is provided in the Environmental Assessment (Annex K).

---

*"Life Zone" is a geographic area defined basically in terms of precipitation and temperature.

Exhibit No. 5: La Unión Forest Management Area



Source: Honduras Country Environmental Profile, a Field Study. JRB Associates, 1981. Pg. 17

EXHIBIT 5

b. Activities

i) Forest Management Plans

A Forest Management Plan (FMP) will be developed for La Uniôn and the other areas to be selected. It will include areas to be cut, maximum permissable annual cuts, logging methods, timber sales procedures and environmental assessment. The FMP will also contain a silviculture program to regenerate logged or depleted areas, a plan for developing a road network in the areas which satisfies logging and fire prevention needs without doing violence to the areas' ecology. Finally, the plan will include a program which will enable small farmers inhabiting forest areas to make more efficient and non-destructive use of its resources.

During year one, a Forest Management Plan will be prepared for La Uniôn, the area selected for immediate intervention. A team of COHDEFOR technicians, assisted by consultants, will compile the existing information, which includes a forest inventory of the area, carry out additional field studies and draft a tentative management plan. The plan will include establishment of two ecological-hydrological reserves. One at Montaña La Muralla and a second at Montaña El Armado. Also, protection forests determined by fragile site and ecological factors, will be determined and excluded from logging, based on general guidelines established in the E.A. With the development of improved or more sophisticated logging practices such as cable systems, these restrictions will be subject to environmental reviews and these forest reserve areas could be logged sometime in the future. A Condition Precedent to subsequent disbursement for forest management activities will govern the creation of these reserves.

To be successful, the plan will require collaboration of the local population. Accordingly, the technicians will present the plan to the farmers, solicit their input and initiate a dialog aimed at involving them in the forest management activities. Once approved, the plan will serve as the basis of the annual COHDEFOR budget for the area. In years three and six, the same process will be repeated in the second and third areas respectively.

The FMP will also contain guidance on the area and volume of wood to be cut. Preliminary estimates, based on a forty year forest rotation cycle and a total commercial area in La Union of approximately 50,000 hectares, place the permissable yearly logging at about 1,200 hectares, which would provide about 100,000 m^3 of logs. The area cut will be disaggregated by forest type -- young pine forest, mature pine forest and mature mixed forest.

The development of the plan for La Uniôn and its presentation to USAID in a satisfactory manner, will be a Condition Precedent to subsequent disbursement for the forestry management component of the project. The Corporation, as a part of the project design, has written a strategy for intervention in La Uniôn which will serve as a point of departure for a complete forest management plan.

A second Condition Precedent to disbursement will require a clear definition of GOH policy and methodology concerning timber harvesting in the project area. This Condition must be satisfactorily met before the funding is provided to implement the forest management plan.

To achieve these actions the project will finance short-term technical assistance, technical specialists, and equipment for aerial photo interpretation.

ii) Forest Protection

A blueprint for forest protection will be developed as part of the FMP and will cover fire prevention, fire suppression, disease control and environmental protection.

Sub-areas that will be given the highest level of attention will be those that: (1) have favorable natural regeneration; (2) are dominated by young trees (less than 10 meters in height); (3) are pine plantations; and (4) are pine or broadleaf forests which protect water sources or other ecological values identified as critical in the E.A. Second priority will be given to areas of medium aged pines (10 meters to 20 meters in height), pine stands that are currently to be exploited, and stands bordering on principal secondary routes. The balance of the forest, not included in categories one and two, will be treated as a third priority.

Fire prevention activities will include forest extension directed at local residents, the construction of firebreaks, and the setting of prescribed (controlled) fires. COHDEFOR technicians will carry out a campaign of forest extension to educate the local inhabitants as to the advantages of protecting the forest from fire and grazing. To complement and reinforce activities related to forest management and protection, a national public education campaign will be developed and implemented to bring about a greater awareness for the need to preserve forest resources.

Firebreaks interrupt the continuity of combustible material, thereby inhibiting the free propagation of fire and facilitating the control of forest fires. The location of the breaks will be determined by the combustible material, type of forest, existing infrastructure and wind direction.

Prescribed fires, set correctly and during the appropriate period of the year, are an economical tool to improve pine forest conditions and to help control forest fires. In the project area, prescribed fires will be set to reduce the level of flamable material, to improve grass cover and to prepare areas for natural regeneration. Each fire will be set according to its own plan which will include: (1) diagnosis and mapping of the area; (2) preparation of the area isolating it from the rest of the forest with firebreaks; and (3) evaluation immediately after the fire and three months later.

Without doubt, early detection is the most efficient method for reducing the cost of fighting fires as well as minimizing the damage caused by them. To this end, the project will support the installation of a detection system which is financially and technologically fitted to the country's forests. The key to this system will be the construction of fire towers located at strategic points. While the final determination as to the number and location of fire towers will be treated in the FMP, preliminary research by COHDEFOR indicates that a minimum of four such towers will be required in the La Unión forest. Each of the towers will be manned by COHDEFOR employees, communicating through two-way radios to establish reliable communications among the watch towers, regional office and field crews.

The fire control towers will be complemented by roving guards whose function will be to patrol designated forest areas to detect fires. The deployment of the guards will vary according to the season of the year.

When fires do occur, it will be necessary to surpress them in the most expedient fashion. To this end, the project will support the creation of fire fighting brigades, within COHDEFOR, to work in the project area. Only a few directly employed ground crews will be needed because much of the fire prevention and fighting will be carried out by those campesino groups involved in forest management and utilization. It is expected that five brigades, consisting of 10 persons each, will be created and they will work during the fire season (December-May). The efforts of these brigades will be complemented by volunteer fire fighters drawn from the local residents who derive their income from the forest. Both the brigades and the local resident groups will be outfitted and trained with project resources.

A second element of the protection program will consist of activities to combat timber loss to pest damage. The principal threat is the bark beetle (Dendroctonus spp.). This insect is found throughout the pine forest in the Southern United States, and in many parts of Honduras. In the past, damage caused by this insect has reached catastrophic proportions. A bark beetle epidemic in 1965 killed almost one fourth of the mature timber in the country. Between 1982 and 1986 there have been 708 reported bark beetle outbreaks.

Pest management will consist of prevention, detection and control. The prevention activities will be comprised of a package of silviculture practices (e.g. prescribed burnings, forest thinnings) designed to maintain the vigor of the stands thereby making them less susceptable to infestation. Detection procedures will include aerial and terrestial reconnaissance. Sanitation practices will eliminate affected timber so as to control the spread of infestations. These actions will consist of either salvage cutting (i.e. cutting then spraying the fallen timber to kill the pests and save usable wood for commercial purposes) or complete cutting and burning of affected timber. The procedure used in each individual case will be dependent upon the degree of infestation. Early in project implementation, T.A. experts will review the pest infestation situation and design a prevention, detection and control package to combat it. This package will be reviewed and updated periodically over the life of the project. No procurement or use of pesticides is contemplated at this time for pest control. If, during the life of the project it becomes necessary to utilize chemical control measures, an appropriate environmental assessment will be carried out prior to approval and funding of such practices.

The primary inputs financed by the project are personnel for fire protection, the construction of fire towers, vehicles and their operation, fire control equipment, and a short-term consultant in bark beetle control.

iii) Road Networks

The first project area, La Unión, already enjoys a relatively ample road network built by the COH and COHDEFOR over the years, principally for forest protection. For example, after the bark beetle epidemic in 1965, the COH, with A.I.D. financing, constructed a 65 kilometer secondary route linking Jutiapa with La Unión, and initiated construction of the road between Salama

and La Unión. Subsequently, COHDEFOR finished this route and constructed a number of other roads bringing the total to approximately 150 kilometers in the target area. As part of the FMP, the road needs will be reviewed and additions planned. The road network will include three different categories (principal forest roads, hauling roads, and skid trails) with discrete specifications for each type laid out in the Forest Management Plan. The roads to be constructed will adhere to a series of environmental criteria, and no additional roadwork will be carried out without previous environmental assessment, approval/amendment of the FMP and concurrence of A.I.D.

All roads needed for logging operations will be built by the loggers according to COHDEFOR specifications. General layout and specifications of the roads are part of the FMP. These will be translated into precise specifications by a COHDEFOR road engineer and included in the timber sale contract signed between COHDEFOR and the loggers. The roads will be staked out in the field by COHDEFOR engineers who will inspect construction to assure that specifications are met. Since no timber may be moved over the road until it has been approved by COHDEFOR, the logger has a strong incentive to comply with the contractual specifications.

The roads will require maintenance even after logging is completed, since they are essential for fire protection of the regenerating forest after logging. As the loggers will be in a specific area for only a short time, this maintenance of forest roads will be the responsibility of COHDEFOR. To the extent possible routine maintenance will be done with hand labor carried out by local inhabitants. Individuals or groups will be given a contract to maintain a specific stretch of road. Major road repairs or maintenance of stretches where hand labor is not feasible, will be contracted out to local construction companies. All maintenance contracts and the inspections needed for their compliance will be the responsibility of the COHDEFOR road engineers. Technical guidelines for road construction and maintenance are provided in the E.A. (Annex K).

The project includes financing for road maintainance and for a position of a civil engineer.

iv) Silviculture

The basic aim of forest management is to sustain the productivity of the area under management. In La Union and the second project area, this sustained productivity will produce a continuity of harvest that will greatly increase in the future as the silvicultural practices (the growing and tending of stands of trees) increase the yield of the forest.

One of the most powerful tools to stimulate natural regeneration of the forest is the use of correct logging practices. The project will develop specifications for logging techniques and these will be included in the timber sale contract. Specifications will cover such matters as the numbers and kinds of seed trees to leave, the location of skid trails, the disposal of logging slash, the location and design of loading sites, the size and shape of forest clearings, and other practices. Seed trees will be selected and marked in the field by COHDEFOR technicians, who will also be responsible for inspecting sites during and after logging, and for reporting and correcting any infractions of the timber sale

contract. Technicians will identify and mark the areas designated for natural regeneration and assure that they are protected against fire. Additional environmental mitigative measures to be adopted as part of the silvicultural practices are presented in Annex K.

For some limited areas on which natural regeneration is not possible for lack of seed trees or other reasons, the management plans will prescribe planting or direct seeding. This will require construction of forest nurseries and the establishment of plantations, or the use of direct seeding techniques. However, it is expected that this type of relatively expensive artificial regeneration will not be required except on a small fraction of the area. Experience has demonstrated that seedling establishment is prolific once fire and cattle are excluded from an area. Both natural and artificially regenerated young forests will require intensive maintenance and protection during the first 7 to 8 years when the young trees are very susceptible to damage by fire. Once the new forest has become established, the seed trees will be harvested and intermediate cuttings will be carried out as the forest develops in order to obtain the maximum benefits.

Exhibit No. 6 indicates the silvicultural program that can be applied in La Unión:

Exhibit No. 6

Silviculture Scheme for the La Unión Area

TIME	ACTIVITY
2-3 Years before harvest	- Intensive protection - Controlled fires in preparation of the site
1-2 Years before harvest	- Intensive protection - Marking of seed-trees. 15 trees/ha - Delimitation of areas to be regenerated - Delimitation of areas to be scarified
During Harvest	- Intensive protection - Harvest leaving seed trees - Management of residues
1 Year after harvest (After the dry season)	- Intensive protection - Evaluation of regeneration - Excellent 2,000 (trees/ha) - Enough 1,600 - 2,000 (trees/ha) - Insufficient 1,600 (trees/ha)

TIME	ACTIVITY
2 Years after harvest	- Planting of areas with insufficient regeneration - Spacing 2x2 mts - Weeding (if necessary)
5-6 Years	- Harvest of seed trees
7-10 Years	- Intensive protection - Non-commercial thinning (leaving 1,200-1,400 trees/ha)
12-15 Years	- Extensive protection - Controlled fires - First commercial thinning (leaving 800-1,000 trees/ha)
17-20 Years	- Extensive protection - Controlled fires every two years - Second thinning (leaving 600-700 trees/ha)
22-25 Years	- Extensive protection - Controlled fires - Third commercial thinning (leaving 400-500 trees/ha)
27-30 Years	- Extensive Protection - Controlled fires - Regeneration cut (leaving 200-250 trees/ha)
35-40 Years	- Extensive protection - Controlled fires - Final harvest reserving 12-15 seed trees per hectare

It is expected that two types of logging methods will be applied in management areas - removal cutting and seed trees cutting. Removal cutting will be used in young stands with poorly formed overmature trees scattered throughout the area. All trees in the older age class will be removed. The advantages of this technique are: 1) it allows for utilization of the overmature trees, and 2) it leaves the younger stand free to grow without competition from the larger trees.

Seed tree harvest will be applied only to areas in which the majority of trees are either mature (DBH of more than 30cm) or defective. At least 15 selected seed trees/hectare will be left for regeneration. After regeneration is established the seed trees will be removed to release the development of the new forest generation. This natural regeneration process may be augmented by soil treatments and controlled burnings.

The logging methods to be used will be a combination of machine power (viz., crawler tractors and skidders) and animal power (e.g. oxen). It is judged that this mix will permit a rational exploitation of forest resources and minimize unfavorable environmental impact while simultaneously creating local employment. Crawler tractors and skidders will be employed in areas with minimum size of at least 10 hectares and with gradients of up to 40 percent. The tractors will be used to construct collection points and to drag logs to them. Oxen will be employed in stands with relatively low volume where mechanical logging would be not be economical, where the gradient is too steep for tractors to operate effectively, and where regeneration is already established so that special care must be taken to limit damage to young trees.

Project inputs to achieve these actions include personnel for the FMU's, periodic visits of a short-term consultant, vehicles and their operational costs. The project will also finance the construction of nurseries, applied field research, as well as the repair of two forest camps and of the CONDEFOR office in La Union.

v) Small Forest Enterprise Activities

After years of experience, CONDEFOR is giving more emphasis to its policy of involving the local population in the benefits derived from the forest. The project will promote income generating activities for a wide sector of the population living in and near the forest, especially by involving them in utilization, one of the financially more interesting activities.

Promoting and assisting the local inhabitants to shift toward deriving more income from the forest will require intensive, skillfull work during several years. Guidance will be offered by a contracted private sector technical assistance team which will also manage a line of credit for small campesino enterprises. This team will establish a dialogue with potential beneficiaries to assess their needs and capability, and to develop a strategy of project intervention. They will also carry out baseline studies of relevant socio-economic indicators against which later evaluations will measure impact of the project on campesino welfare. One of the most important tasks of the technical assistance team will be to do feasibility studies for forest

utilization activities to be carried out by the campesinos, such as logging with oxen, production of railroad ties, production of charcoal and the manufacture of products from small dimension logs.

According to the results of these studies, the technical assistance team will help organize and strengthen the groups of campesinos so as to prepare them to engage in the various forest related activities and enterprises. This will require considerable training of campesinos. The team will also develop the regulations for use of a rotating fund to be created by the project and will help manage this fund.

The technical assistance team will play a crucial role in initiating the campesino forest utilization enterprises and in helping them in technical and managerial aspects, so that they can become independent of outside assistance as rapidly as possible. After three or four years of experience, more ambitious secondary forest industries linked to sawmills will be initiated using the same mechanism.

The primary input to achieve these results will be financing to contract a private sector technical assistance team and to provide a rotating fund for small scale forest enterprises.

vi) Improved Agriculture and Grazing Practices

Land use in the La Unión Forest Management area is predominantly forestry, and population density is relatively low. Nevertheless there is increasing agricultural pressure on the forest due to the traditional farming practices of resident campesinos. These problems, common to most of rural Honduras, have been mitigated in selected areas of southern Honduras by the Mission's Natural Resources Management Project (NRMP/522-0168), through the Ministry of Natural Resources (MNR). The NRMP currently works with over 7000 farm families through 24 field offices, or watershed management units (WMU's), staffed by resident multidisciplinary teams of agronomists, foresters, range specialists, rural development promotors, para-technicians, and W.I.D. agents.

The NRMP will organize and staff a new field office in collaboration with COHDEFOR's office in La Unión and later in the second forest area. Additional field technicians and para-technicians will be assigned to other municipalities in the area. The annual operational plans and periodic work plans for this team will be developed in collaboration between the NRMP and COHDEFOR staff. The agriculture and range management personnel will be financed by the Forestry Development Project, but will receive technical backstopping from the NRMP and other branches of the MNR. The Project Paper Technical Analysis entitled "Estrategia de Intervención del Area de Manejo La Unión, Olancho" (Annex No. I) provides a detailed description of how this activity will be carried out. In brief, it is anticipated that major activities will include the following:

- range and pasture improvement
- soil conservation
- improved cropping practices (primarily basic grains)

- crop diversification
- agroforestry
- women-in-development activities
- small-scale irrigation

The exact operational plan for the team will be determined after project authorization through discussions between COHDEFOR, MNR, USAID, and USFS officials. Salaries, vehicles, equipment, supplies, and other inputs have been budgeted for these activities, and credit and subsidy funds will be made available through the existing fiduciary agreement between MNR and BANADESA. Credit funds drawn from local currency resources, will be made available for partial financing of improvements such as terracing, drainage, small irrigation systems, livestock management facilities, pasture improvements, etc. Subsidies will be used for establishing community nurseries and other community improvements. The credit/subsidy fund account is managed by BANADESA, with close supervision by NRMP technicians and disbursements are based on farm management plans and formal credit agreements secured by crop guarantees, following practices currently in use under the NRMP.

To achieve these actions the project inputs include staff for the agricultural teams in the Forest Management Units, transportation for them, and credit and subsidies for the farmers.

3. Strengthening Forest Industry

Project actions to address the constraints affecting the loggers and sawmillers directly support the GOH policy decision to enhance the role of the private enterprise in lumber production. It is judged that the provision of a healthier policy environment, credit and technical assistance will create the conditions required for the private sector to assume an expanded role.

a. Activities

i) Timber utilization

To overcome the technical constraints to better utilization of the standing timber volume, the project will create a Forest Industries Technical Assistance Unit within COHDEFOR. This Unit will be a field team of qualified technicians, supported by project financed consultants, who will work with loggers and sawmillers to improve the efficiency of their operations. With respect to the loggers, one of the first tasks of the Unit will be to survey current practices used in wood harvesting operations in Honduras, giving special attention to logging techniques, environmental protection, equipment maintenance and residue use. Based on this survey, the Unit will devise methods for improving operational efficiency and soundness. These methods will be tested on-site, with the direct participation of the loggers, and final adjustments will be made. Thereafter, the Unit will offer continous on-site technical assistance to selected harvesting operations. They will carry out feasibility studies on logging residue use and promote the implementation of viable alternatives, making use of project credit whenever appropriate.

As a normal part of its function, the Unit will prepare simple manuals on the selected logging and environmental management practices for use by the private sector. These institutional guidelines will be complimented through formal training. The project will finance ten training courses to be held at ESNACIFOR on harvesting methods for private sector loggers -- both technicians and laborers. These courses will address logging and road construction/maintenance practices; environmental assessment and impact mitigation; equipment maintenance, residue use, accounting and other technical constraints of the loggers.

Initially, the Unit will provide assistance at no cost to industry. However, it is forseen that the Unit will become financially self-supporting, charging for its services once it has established its credentials as a useful, solid service organization. This transition from a "no-cost support" to a "fee for services" operation will be gradual, but should be fully established by the project's fourth year.

The members of the Unit will receive on-the-job training and be exposed to well-functioning logging operations through study tours abroad. Project financed short-term consultants, specialized in lumber milling will be made available to assist the Unit on an intermittant basis. The project will also provide vehicles and materials to the Unit.

ii) Sawmill Efficiency

The same Forest Industries Technical Assistance Unit described above, will help overcome technical constraints to improved efficiency of the sawmills, giving special emphasis to sawmill maintenance, wood drying, lumber handling and mill residue utilization. In this context, an initial task of the Unit will be to survey current sawmill practices in Honduras, and on this basis select the appropriate methods to improve operations. As in the case of timber utilization, these improved practices will be tested and refined in cooperation with selected, progressive sawmillers. Subsequently, the Unit will provide continous on-site technical assistance to the sawmills. The Unit will carry out feasibility studies on sawmill residue use and promote the implementation of alternative, more efficient technologies (e.g., bandsaws, versus circular saws). Resources needed to finance these new milling technologies will be furnished through a project credit line which is discussed below.

The technical assistance offered by the Unit to the industry will be complimented by a set of short-courses (approximately thirty-five) on sawmill practices. These courses will be offered at ESNACIFOR and will be directed at private sawmill owners and their employees. They will cover sawmill maintenance, wood drying, lumber handling, mill residue utilization, management, accounting and other technical constraints of the sawmills.

The project will provide on-the-job training and study tours to continually upgrade the skills of the members of the Unit. During the first two years of implementation, the Unit will have the expertise of an expatriot sawmill technician whose efforts will be expanded by the presence of intermittant short-term consultants.

The work of the COHDEFOR Technical Assistance Unit will be complimented by the provision to AMADHO of a Forest Industry expert for a period of 18 months. He will advise the Association's directorate, on the existing status of the forest industry and provide the Association with a program to assure that the industry continues and flourishes. This will entail a detailed action plan according to which the private sector can collaborate with COHDEFOR to take full advantage of the increased responsibilities it has been assigned in lumber processing and marketing.

Project funded assistance to the private sawmills will be rounded out through international and domestic training programs, including study tours to visit sawmills in the United States.

iii. Credit

The Project will establish a $4.9 million credit facility to meet financial needs of private loggers and sawmill operators to replace/overhaul equipment and machinery, carry out circular to band saw mill conversions, and obtain operating capital for the purchase of parts and production inputs. Project design related research revealed the existence of an unsatisfied demand for credit equal to U.S. $13 million. However, a significant portion of this demand is attributable to large scale forest industries which have alternative sources of funding at their disposition. Accordingly, the provision of $4.9 million in credit plus the reflows generated by repayments from borrowers, is judged to be adequate to satisfy the credit needs of loggers and sawmill entrepreneurs interested in upgrading their operations.

These credit resources will be channeled through a rediscount line in the Central Bank of Honduras (CBH) to firms in the primary forest industry. Establishment of a specialized rediscount line will increase the funding leverage of the banks serving firms in the primary forest industry.* These funds will be provided to private borrowers in the industry through one private bank (PB), to be selected through an open bidding process. The specific criteria to select the participating PB will be defined in the course of Project Implementation, but will include: (i) willingness on the part of the PB to set up a Technical Unit, staffed by qualified personnel to service sawmill operators accessing loan resources provided by the project; (ii) proof that PB participation in the project does not create conflicts of interest and (iii) proven capability to manage this type of loan portfolio.

---

* (Specific mechanisms for administering and managing this credit facility will be refined in an implementation letter and/or a credit agreement document. At this time, USAID/Honduras is undertaking a review of its credit strategy in light of recent problems with the Export Development and Services Credit Line (522-0207) and the Irrigation Financing Facility (522-0268). The final mechanism for this Project's credit line will be based on the outcome of the Mission's credit strategy review and negotiations with the Government of Honduras.)

Based on recent evaluations of the performance of existing rediscount lines for other industry segments in the country, the project will utilize mechanisms that guarantee the efficient disbursement of financial resources. These mechanisms entail the establishment of two separate funds within the rediscount line. Fund "A" will consist of approximately U.S. $ 2.9 million to be rediscounted at no risk for the PB, while fund "B" will consist of aboutU.S. $2 million to be rediscounted with 100 percent risk for the PB. The PB will be permitted to borrow up to 60 percent from fund "A" and, consequently, up to 40 percent from fund "B". However, the provision of a 60/40 split of resources from funds "A" and "B" will not be automatic. The specific split of resources between the two funds will be determined by an impartial and technically qualified private intermediary. In this form, the project will remove one of the principal constraints limiting the provision of financial support by private banks to firms in the forest sector, by significantly lowering the risk of making loans to sawmill operators and loggers. Reflows from the original loans will continue to be used for up to ten years after the PACD for this original purpose of this credit line.

A local private sector consulting firm will be contracted, on a competitive basis, to serve as an intermediary between the millers, loggers and the PB.

Under the project, the contractor will analyze feasibility studies and loan applications prepared by private loggers and sawmill operators. Additionally, the contractor will assist each borrower in negotiating the precise terms of its loan with the PB. The participation of the contractor will also provide an essential support to the PB in making its final decision to approve or reject a loan. The contractor will charge a fee (1 percent of the loan interest rate) to defray its expenses for assisting the private sector loggers and millers in obtaining credit.

Another important feature of the project's credit component for private firms is related to the role to be played by the CBH in administering the rediscount line of credit. Based on lessons learned in other development projects currently being implemented, the role of the CBH will be limited to a revision of loan applications submitted by the PB, simply assuring that all documents are in order, including the "Certificate of Eligibility" issued by the contractor. Specifically, the CBH will not scrutinize the credit worthiness of the borrower nor judge the financial and economic viability of the proposed investment. This will facilitate the loan disbursement process by preventing unnecessary and time-consuming bureaucratic delays. The Project Agreement will include a covenant to clearly restrict the CBH's role to "review" and not scrutinize.

The financial package crafted for the project will provide an attractive interest rate spread for the PB. The precise rate margin accruing to the PB will vary in each case, as a result of direct negotiations sustained between the loan applicant -assisted by the contractor - and the PB. However, based on current limits authorized by the GOH, the maximum spread to be charged by the PB on funds drawn from the project's rediscount line will equal 8 percent, and the maximum rate to be charged to a borrower will be 19 percent. Finally, the project will induce the GOH to establish a series of mechanisms to increase the attractiveness to the PB of making loans to sawmills.

D. Financial Plan

The Forestry Development Project is a seven year effort with a total cost of $31.688 million of which $20 million (loan $12 million, grant $8 million) will be provided by A.I.D. and the Honduran Government will contribute with $11.688 million.

The percentage contribution for the project is 63 percent for AID and 37 percent for the Government of Honduras.

Exhibits Nos. 7 and 8, Summary Cost Estimate and Financial Plan and Disbursement Plan, show all the cost of the project by component and source of funds. The Notes to Summary Cost Estimate and Financial Plan describe the usage of funds by component and activities of the project.

1. Disbursement System

Financing of project costs will follow the procedures for direct payment and reimbursement according to A.I.D. existing practices. Purchase of aerial photography, computer equipment, vehicles, office supplies, materials and other costs will be paid directly to the suppliers or participants by the Mission.

Credit funds provided for the forest industry will be channeled through the Central Bank and a private commercial bank. Credit funds for campesino enterprises will be handled by a Private Voluntary Organization and a Revolving Fund will be established for this purpose. Credit funds and subsidies for agriculture and cattle activities will be administered by the National Resources Management Project through private commercial banks or BANADESA. To facilitate implementation, a project revolving fund will be established using ESF local currency. The revolving fund will permit the project to have sufficient funds to meet financial requirements.

2. Audits

Audit of Project activities will be performed by external auditors contracted by CODEFOR. The amount of $75,000 has been budgeted to pay for the audit costs over the life of the project. The project will also be audited by the AID Regional Inspector General. Financial reviews will be made by the Office of the Controller to verify the propriety of controls and the adequacy of budget, accounting and financial reporting systems and the general effectiveness of financial management within the various recipient organizations.

Exhibit 7

FORESTRY DEVELOPMENT PROJECT (522-0246) -- SUMMARY COST ESTIMATE AND FINANCIAL PLAN

ITEM	AID GRANT FX	AID GRANT LC	AID LOAN FX	AID LOAN LC	AID FX	AID LC	TOTAL AID	GOH IN-KIND	GOH FINANCIAL	TOTAL PROJ. COST
REORIENTATION OF COHDEFOR										
OUTPUT 1 -- Stumpage Sale & Valuation										
Timber Mgt.Adv./Chief of Party	360.0				360.0		360.0			360.0
Forest Timber Sales Expert	240.0				240.0		240.0			240.0
Forestry Enviromental Protection Expert	30.0				30.0		30.0			30.0
Lumber Manufacturing Expert	30.0				30.0		30.0			30.0
Logging Engineer	60.0				60.0		60.0			60.0
Forest Economist	60.0				60.0		60.0			60.0
Computer Software Specialist	30.0				30.0		30.0			30.0
Vehicles 4WD			456.0		456.0		456.0			456.0
Field equipment for 11 crews			110.0		110.0		110.0			110.0
Aerial photography			300.0		300.0		300.0			300.0
Chief timber Sales Unit								195.0		195.0
Logging Expert								15.0		15.0
Timber sales Crews(3pers. each)crew-yr								558.0	540.0	1098.0
Logging Supervision Tech.								273.0		273.0
INFONAC Timber sale crew									117.0	117.0
INFONAC Office Staff (50%)								665.0		665.0
Vehicle O & M									638.4	638.4
OUTPUT 2 -- Lumber Export Control										
Consult.Export Documentation	30.0				30.0		30.0			30.0
Consultant Software	10.0				10.0		10.0			10.0
Cons.Lumber Quality Supervis.	30.0				30.0		30.0			30.0
Consultant Market Analysis	50.0				50.0		50.0			50.0
Trips to foreign markets			110.0		110.0		110.0			110.0
Subscriptions trade public.			2.0		2.0		2.0			2.0
Personal Computer			5.0		5.0		5.0			5.0
Market Analyst (50%)								105.0		105.0
Export Documentation Spec. (50%)								79.0		79.0
Quality Control Spec. (50%)								79.0		79.0
Bilingual Secretary (50%)									31.9	31.9
OUTPUT 3 -- COHDEFOR's Efficiency										
Public Admon. Specialist	180.0				180.0		180.0			180.0
Mgt. & Financial Consultant	120.0				120.0		120.0			120.0
Personal Computer			20.0		20.0		20.0			20.0
Equip.& suppl.ESNACIFOR			30.0		30.0		30.0			30.0
Promotion ESNACIFOR				30.0		30.0	30.0			30.0
Management Specialist								210.0		210.0
TRAINING FOR THE REORIENTATION OF COHDEFOR										
Academic in U.S.	924.0				924.0		924.0			924.0
Academic in Honduras		468.0				468.0	468.0			468.0
Non-academic outside Honduras	560.8				560.8		560.8			560.8

03-Sep-87 Directory C:\FOREST Lotus BUDSQURC.WKS

Exhibit 7

FORESTRY DEVELOPMENT PROJECT (522-0246) -- SUMMARY COST ESTIMATE AND FINANCIAL PLAN

ITEM	AID GRANT FX	AID GRANT LC	AID LOAN FX	AID LOAN LC	AID FX	AID LC	TOTAL AID	GOH IN-KIND	GOH FINANCIAL	TOTAL PROJ. COST
Non-academic at ESNACIFOR		389.1				389.1	389.1			389.1
Non-acad.,in Honduras, not ESNACIFOR		278.3				278.3	278.3			278.3
TOTAL REORIENTATION OF COHDEFOR	2,714.8	1,135.4	1,033.0	30.0	3,747.8	1,165.4	4,913.2	2,179.0	1,327.3	8,419.5
FOREST MANAGEMENT OF SELECTED AREAS										
OUTPUT 4 -- Forest Management Plans										
Forest Mgt. Specialist	60.0				60.0		60.0			60.0
Vehicle 4WD			15.0		15.0		15.0			15.0
Aerial photo transfer equip.			10.0		10.0		10.0			10.0
Office & drafting materials			3.0		3.0		3.0			3.0
Chief For.Mgt.Design Team									67.7	67.7
Forest Manager/Silviculturist									48.0	48.0
Aerial photo interpreter									9.0	9.0
Vehicle O & M									2.4	2.4
OUTPUT 5 -- Forests Protection										
Vehicles 4WD			195.0		195.0		195.0			195.0
Two-way radios			40.0		40.0		40.0			40.0
Hand tools			26.0		26.0		26.0			26.0
Consultant bark beetles	60.0				60.0		60.0			60.0
Aerial surveillance				11.0	0.0	11.0	11.0			11.0
Power saws for salvage work			9.6		9.6		9.6			9.6
Environmental Education Program		100.0				100.0	100.0			100.0
Technicians forest protection								128.0		128.0
Fire brigade foreman (permanent)								40.0	24.0	64.0
Fire Brigade foreman (temporary)									27.5	27.5
Fire lookout									33.3	33.3
Roving fire patrol									93.6	93.6
Laborers								131.0	149.8	280.8
Drivers									78.0	78.0
Tower construction									31.0	31.0
Materials									57.5	57.5
Fire fighting overtime									92.5	92.5
Vehicle O & M									153.6	153.6
OUTPUT 6 -- Forest Roads										
Surveying & drafting equipment			3.0		3.0		3.0			3.0
Road maintenance-by machine				2215.0		2215.0	2215.0			2215.0
Civil Engineer									84.6	84.6
Surveyor									27.0	27.0
Road Maintenance by hand									991.5	991.5
OUTPUT 7 -- Sites Regenerated										
Forest Management Specialist	70.0				70.0		70.0			70.0

FORESTRY DEVELOPMENT PROJECT (522-0246) -- SUMMARY COST ESTIMATE AND FINANCIAL PLAN

ITEM	AID GRANT FX	AID GRANT LC	AID LOAN FX	AID LOAN LC	AID FX	AID LC	TOTAL AID	GOH IN-KIND	GOH FINANCIAL	TOTAL PROJ. COST
Enviromental Assessment AREAS II and III	40.0				40.0		40.0			40.0
Wildlife/endangered species inventory	15.0				15.0		15.0			15.0
Pick-up truck 4WD			180.0		180.0		180.0			180.0
Forest tools & materials			31.0		31.0		31.0			31.0
Rehabilitation forest camps				160.0		160.0	160.0			160.0
Remodel COHDEFOR off. La Union				5.0		5.0	5.0			5.0
Construction community center				50.0		50.0	50.0			50.0
Nursery constructions				13.0		13.0	13.0			13.0
Nursery equipment				12.0		12.0	12.0			12.0
Study of site quality	30.0				30.0		30.0			30.0
Forest camp & office in La Union								100.0		100.0
Base Line Studies of AREAS II and III								40.0		40.0
Enviromental Applied Resource								25.0		25.0
Chief La Union Mgt. Unit								195.0		195.0
Chief For.Mgt.Unit II								90.2		90.2
Forest Manager/Silviculturist								120.0		120.0
Forest Technician								120.0		120.0
Administrator									132.0	132.0
Secretary									72.6	72.6
Office Assistant								17.2		17.2
Guard									32.8	32.8
Mechanic									75.6	75.6
Mechanic Assistant									45.6	45.6
Warehouse keeper									30.0	30.0
Nurseryman									12.0	12.0
Laborers									309.3	309.3
Vehicle O & M									196.8	196.8
OUTPUT 8 — Income from Forest for Local Population										
TA to campesinos through PVD	1310.0				1310.0		1310.0			1310.0
Rotating fund Campesino enterprise				400.0		400.0	400.0			400.0
OUTPUT 9 — Improved Agriculture & Grazing										
Pick-up truck & jeep 4WD			108.0		108.0		108.0			108.0
Truck (2 ton)			18.5		18.5		18.5			18.5
Motorcycles			23.8		23.8		23.8			23.8
Soil Conservation Subsidy				150.0		150.0	150.0			150.0
Range Management Subsidy				300.0		300.0	300.0			300.0
Chief Ag. Unit La Union									150.7	150.7
Ag. Ext. Agents (Agronomos)									152.1	152.1
Range Mgt. Ext. Agents									152.1	152.1
Home Econ. Ext. (From. Social)									152.1	152.1
Ag. Para-Technicians									151.2	151.2
Credit Manager									37.8	37.8
Office furniture									2.8	2.8

03-Sep-87 Directory C:\FOREST Lotus BUDSOURC.WK5

Exhibit 7

FORESTRY DEVELOPMENT PROJECT (522-0246) -- SUMMARY COST ESTIMATE AND FINANCIAL PLAN

ITEM	AID GRANT FX	AID GRANT LC	AID LOAN FX	AID LOAN LC	AID FX	AID LC	TOTAL AID	GOH IN-KIND	GOH FINANCIAL	TOTAL PROJ. COST
Office supplies									13.4	13.4
Credit for crops and cattle									563.5	563.5
Vehicle O & M									139.2	139.2
Motorcycle O & M									46.0	46.0
Per diem national personnel									49.5	49.5
TRAINING FOR FOREST MANAGEMENT										
Academic in U.S.	154.0				154.0		154.0			154.0
Non-academic at ESNACIFOR		376.5				376.5	376.5			376.5
Non-acad.,in Honduras, not ESNACIFOR		109.4				109.4	109.4			109.4
TOTAL FOREST MANAGEMENT OF SELECTED AREAS	1,739.0	585.9	662.9	3,316.0	2,401.9	3,901.9	6,303.8	1,006.4	4,490.1	11,800.3
STRENGTHENING OF FOREST INDUSTRY										
OUTPUT 10 + 11 -- Improved Timber Utilization										
Sawmill Expert	240.0				240.0		240.0			240.0
Consultants - short term	180.0				180.0		180.0			180.0
Advisor to AMADHO		93.9				93.9	93.9			93.9
Product & Market Diversification studies by AMADHO	60.0				60.0		60.0			60.0
Promotion brochures of Honduran wood by AMADHO		8.0				8.0	8.0			8.0
Personal Computer for AMADHO	6.9				6.9		6.9			6.9
Vehicle 4WD for AMADHO	15.0				15.0		15.0			15.0
Vehicles pick-up 4WD, light			36.0		36.0		36.0			36.0
Vehicles pick-up 4WD, heavy			32.0		32.0		32.0			32.0
Equipment & materials			16.0		16.0		16.0			16.0
Publication of manuals				6.0		6.0	6.0			6.0
Chief Forest Ind. TA Unit									200.0	200.0
For.Industry Technicians									264.0	264.0
Secretary									40.0	40.0
Office rent & maintainance								24.0		24.0
ESNACIFOR sawmill								160.0		160.0
ESNACIFOR saw filing shop								162.5		162.5
Vehicle O & M									72.0	72.0
Travel & per diem for TA Unit									39.0	39.0
OUTPUT 12 -- Financing for Industry										
Credit for forest industry(FX)			3,000.0		3000.0		3000.0			3000.0
Credit for forest industry(LC)				1900.0		1900.0	1900.0			1900.0
TRAINING FOR STRENGTHENING FOREST INDUSTRY										
Non-academic outside Honduras	270.5				270.5		270.5			270.5
Non-academic at ESNACIFOR		141.3				141.3	141.3			141.3
TOTAL STRENGTHENING OF FOREST INDUSTRY	772.4	243.2	3,084.0	1,906.0	3,656.4	2,149.2	6,005.6	346.5	615.0	6,967.1

03-Sep-87 Directory C:\FOREST Lotus BUDSOURC.WKS

Exhibit 7

FORESTRY DEVELOPMENT PROJECT (522-0246) -- SUMMARY COST ESTIMATE AND FINANCIAL PLAN

ITEM	AID GRANT FX	AID GRANT LC	AID LOAN FX	AID LOAN LC	AID FX	AID LC	TOTAL AID	GOH IN-KIND	GOH FINANCIAL	TOTAL PROJ. COST
ADMINISTRATION										
Project Officer	420.0				420.0		420.0			420.0
Training Coordinator		89.3				89.3	89.3			89.3
Evaluations	125.0				125.0		125.0			125.0
Audits	75.0				75.0		75.0			75.0
Analysis of Present Forestry Practices	40.0				40.0		40.0			40.0
Vehicles pick-up 4WD, light			48.0		48.0		48.0			48.0
Vehicle O & M			62.4		62.4		62.4			62.4
Household furnitures & appliances for TA		60.0				60.0	60.0			60.0
Project Director								262.9		262.9
Technical Assistant								158.2		158.2
Administrative Assistant								105.0		105.0
Bilingual Secretary									63.0	63.0
Office rent & maintainance								24.0		24.0
Office equipment									8.0	8.0
Office Supplies									40.0	40.0
TOTAL ADMINISTRATION	660.0	149.3	110.4	0.0	770.4	149.3	919.7	550.1	111.0	1580.8
PROJECT SUBTOTAL	5,886.2	2,113.8	4,890.3	5,252.0	10,776.5	7,365.8	18,142.3	4,082.0	6,543.4	28,767.7
INFLATION & CONTINGENCY (10%)	0.0	0.0	1,103.9	753.8	1,103.9	753.8	1,857.7	408.2	654.3	2,920.2
PROJECT TOTAL	5,886.2	2,113.8	5,994.2	6,005.8	11,880.4	8,119.6	20,000.0	4,490.2	7,197.7	31,687.9

TOTAL AID GRANT	TOTAL AID LOAN	TOTAL AID	TOTAL GOH	TOTAL PROJECT
8000.0	12000.0	20000.0	11687.9	31687.9

Exhibit 8

FORESTRY DEVELOPMENT PROJECT (522-0246) -- AID DISBURSEMENT PLAN

-CODE-- 6/L 1/2	$/Lemp 3/4	ITEM	UNIT	COST/ UNIT US$000	YEAR 1 NO. UNITS	YEAR 1 COST/ YEAR US$000	YEAR 2 NO. UNITS	YEAR 2 COST/ YEAR US$000	YEAR 3 NO. UNITS	YEAR 3 COST/ YEAR US$000	YEAR 4 NO. UNITS	YEAR 4 COST/ YEAR US$000	YEAR 5 NO. UNITS	YEAR 5 COST/ YEAR US$000	YEAR 6 NO. UNITS	YEAR 6 COST/ YEAR US$000	YEAR 7 NO. UNITS	YEAR 7 COST/ YEAR US$000	TOTAL NO. UNITS	TOTAL PROJECT COST US$000	Explanation of line items (Will not be printed in final version. For reference only)
		REORIENTATION OF COHDEFOR																			
		OUTPUT 1 -- Stumpage sale & valuation																			
1	3	Timber Mgt.Adv./Chief of Partyps		10.00	6	60.0	12	120.0	12	120.0	6	60.0		0.0		0.0		0.0	36	360.0	1
1	3	Forest Timber Sales Expert	pm	10.00	3	30.0	12	120.0	9	90.0		0.0		0.0		0.0		0.0	24	240.0	
1	3	Forestry Environmental Expert	pm	10.00			3	30.0		0.0		0.0		0.0		0.0		0.0	3	30.0	
1	3	Lumber Manufacturing Expert	pm	10.00		0.0		0.0	3	30.0		0.0		0.0		0.0		0.0	3	30.0	
1	3	Logging Engineer	pm	10.00		0.0		0.0	6	60.0		0.0		0.0		0.0		0.0	6	60.0	
1	3	Forest Economist	pm	10.00		0.0		0.0	6	60.0		0.0		0.0		0.0		0.0	6	60.0	
1	3	Computer Software Specialist	pm	10.00		0.0		0.0	3	30.0		0.0		0.0		0.0		0.0	3	30.0	
2	3	Vehicles 4WD	number	12.00	19	228.0		0.0		0.0		0.0		0.0	19	228.0		0.0	38	456.0	
2	3	Field equipment for 11 crews				80.0		5.0		5.0		5.0		5.0		5.0		5.0	0	110.0	
2	3	Aerial photography				0.0		0.0		300.0		0.0		0.0		0.0		0.0	0	300.0	
		OUTPUT 2 -- Lumber Export Control																			
1	3	Consult.Export Documentation	pm	10.00	3	30.0		0.0		0.0		0.0		0.0		0.0		0.0	3	30.0	
1	3	Consultant Software	pm	10.00	1	10.0		0.0		0.0		0.0		0.0		0.0		0.0	1	10.0	
1	3	Cons.Lumber Quality Supervis.	pm	10.00	3	30.0		0.0		0.0		0.0		0.0		0.0		0.0	3	30.0	
1	3	Consultant Market Analysis	pm	10.00	3	30.0	2	20.0		0.0		0.0		0.0		0.0		0.0	5	50.0	
2	3	Trips to foreign markets				22.0		22.0		44.0		22.0		0.0		0.0		0.0	0	110.0	
2	3	Subscriptions trade public.				1.0		0.0		1.0		0.0		0.0		0.0		0.0	0	2.0	
2	3	Personal computer	number	5.00	1	5.0		0.0		0.0		0.0		0.0		0.0		0.0	1	5.0	
		OUTPUT 3 -- COHDEFOR's Efficiency																			
1	3	Public Admon. Specialist	pm	10.00		0.0	12	120.0	6	60.0		0.0		0.0		0.0		0.0	18	180.0	
1	3	Mgt. & Financial Consultant	pm	10.00		0.0	4	40.0	4	40.0	4	40.0		0.0		0.0		0.0	12	120.0	
2	3	Personal Computer	number	5.00	4	20.0		0.0		0.0		0.0		0.0		0.0		0.0	4	20.0	
2	3	Equip.& suppl.ESNACIFOR				30.0		0.0		0.0		0.0		0.0		0.0		0.0	0	30.0	See training annex
2	4	Promotion ESNACIFOR				10.0		10.0		10.0		0.0		0.0		0.0		0.0	0	30.0	
		TRAINING FOR REORIENTATION OF COHDEFOR																			
1	3	Academic in U.S.				22.0		198.0		278.7		216.3		121.0		58.7		29.3	0	924.0	
1	4	Academic in Honduras				31.2		62.4		93.6		93.6		93.6		62.4		31.2	0	468.0	
1	3	Non-academic outside Honduras				120.2		106.8		106.8		106.8		106.8		6.7		6.7	0	560.8	
1	4	Non-academic at ESNACIFOR				79.7		123.7		[illegible]		65.2		10.1		13.5		0.0	0	389.1	
1	4	Non-acad.,in Honduras, not ESNACIFOR				101.3		69.1		12.1		71.8		24.1		0.0		0.0	0	278.3	
		TOTAL FINANCIAL & MG. STRENGTHENING OF COHDEFOR				940.4		1047.0		1438.0		680.7		360.6		374.3		72.2		4913.3	
		FOREST MANAGEMENT OF SELECTED AREAS																			
		OUTPUT 4 -- Forest management plans																			
1	3	Forest Mgt. Specialist	pm	10.00	3	30.0		0.0	2	20.0		0.0		0.0	1	10.0		0.0	6	60.0	
2	3	Vehicle 4WD	number	15.00	1	15.0		0.0		0.0		0.0		0.0		0.0		0.0	1	15.0	
2	3	Aerial photo transfer equip.				10.0		0.0		0.0		0.0		0.0		0.0		0.0	0	10.0	Stereoskelshaaster=$4K,
2	3	Office & drafting materials				1.0		0.0		1.0		0.0		0.0		1.0		0.0	0	3.0	
		OUTPUT 5 -- Forests protected																			
2	3	Vehicles 4WD	number	15.00	2	30.0		0.0	1	15.0	2	30.0	3	45.0	2	30.0	3	45.0	13	195.0	

Exhibit 8

FORESTRY DEVELOPMENT PROJECT (522-0246) -- AID DISBURSEMENT PLAN

-CODE-- G/L 1/2	$/Leap 3/4	ITEM	UNIT	COST/ UNIT US$000	YEAR 1 NO. UNITS	YEAR 1 COST/ YEAR US$000	YEAR 2 NO. UNITS	YEAR 2 COST/ YEAR US$000	YEAR 3 NO. UNITS	YEAR 3 COST/ YEAR US$000	YEAR 4 NO. UNITS	YEAR 4 COST/ YEAR US$000	YEAR 5 NO. UNITS	YEAR 5 COST/ YEAR US$000	YEAR 6 NO. UNITS	YEAR 6 COST/ YEAR US$000	YEAR 7 NO. UNITS	YEAR 7 COST/ YEAR US$000	TOTAL NO. UNITS	TOTAL PROJECT COST US$000	Explanation of line items (Will not be printed in final version. For reference only)
2	3	Two-way radios	number	2.00	[illegible]	16.0		0.0		0.0	8	16.0	4	8.0		0.0		0.0	20	40.0	
2	3	Hand tools				3.0		0.0		1.6		8.0		5.2		1.6		1.6	0	26.0	
1	3	Consultant bark beetles	pm	10.00		0.0	2	20.0		0.0	2	20.0		0.0	2	20.0		0.0	6	60.0	
2	4	Aerial surveillance				1.0		1.0		1.0		2.0		2.0		2.0		2.0	0	11.0	
2	3	Power saws for salvage work	number	0.60	4	2.4		0.0	4	2.4	4	2.4		0.0	4	2.4		0.0	16	9.6	
1	4	Environmental Education Prog.				0.0		100.0		0.0		0.0		0.0		0.0		0.0	0	100.0	
		OUTPUT 6 -- Forest roads																			
2	3	Surveying & drafting equipment				3.0		0.0		0.0		0.0		0.0		0.0		0.0	0	3.0	
2	4	Road maintenance-by machine	km	2.50	82	205.0	82	205.0	82	205.0	160	400.0	160	400.0	160	400.0	160	400.0	886	2215.0	Type A roads machine, 82km exist
		OUTPUT 7 -- Sites regenerated																			
1	3	Forest Management Specialist	pm	10.00		0.0	3	30.0	2	20.0	2	20.0		0.0		0.0		0.0	7	70.0	
1	3	Environment Asses. AREA II-IIIpm		10.00		0.0		0.0	2	20.0		0.0		0.0	2	20.0		0.0	4	40.0	
1	3	Wildlife inventory				0.0				15.0		0.0		0.0		0.0		0.0	0	15.0	
2	3	Pick-up truck 4WD	unit	15.00	2	30.0	2	30.0		0.0	4	60.0	4	60.0		0.0		0.0	12	180.0	
2	3	Forest tools & materials				5.0		3.0		3.0		5.0		5.0		5.0		5.0	0	31.0	
2	4	Rehabilitation forest camps				80.0		0.0		80.0		0.0		0.0		0.0		0.0	0	160.0	
2	4	Remodel COHDEFOR off. La Union				5.0		0.0		0.0		0.0		0.0		0.0		0.0	0	5.0	
2	4	Construction community center				0.0		50.0		0.0		0.0		0.0		0.0		0.0	0	50.0	
2	4	Nursery constructions				0.0		0.0		0.0		13.0		0.0		0.0		0.0	0	13.0	
2	4	Nursery equipment				0.0		0.0		0.0		12.0		0.0		0.0		0.0	0	12.0	
1	3	Study of site quality				30.0		0.0		0.0		0.0		0.0		0.0		0.0	0	30.0	
		OUTPUT 8 -- Income from forest for local population																			
1	3	TA to campesinos through PVO (see separate budget)				141.7		293.1		302.6		240.2		170.0		107.2		55.2	0	1310.0	
2	4	Rotatin fund campesino enterprise				50.0		100.0		100.0		100.0		50.0		0.0		0.0	0	400.0	
		OUTPUT 9 -- Agriculture & grazing improved																			
2	3	Pick-up truck & jeep 4WD	number	12.00	2	24.0		0.0	1	12.0	2	24.0	3	36.0		0.0	1	12.0	9	108.0	Pick-up life = 4 years
2	3	Truck (2 ton)	number	18.50		0.0	1	18.5		0.0		0.0		0.0		0.0		0.0	1	18.5	
2	3	Motorcycles	number	1.70		0.0	2	3.4		0.0	4	6.8		0.0	4	6.8	4	6.8	14	23.8	Bikes life = 2 years
2	4	Soil Conservation Subsidy				10.0		20.0		40.0		40.0		40.0		0.0		0.0	0	150.0	
2	4	Range Management Subsidy				20.0		40.0		60.0		60.0		60.0		60.0		0.0	0	300.0	
		TRAINING FOR FOREST MANAGEMENT																			
1	3	Academic in U.S.				22.0		22.0		22.0		44.0		33.0		11.0		0.0	0	154.0	
1	4	Non-academic at ESNACIFOR				72.7		83.4		63.4		46.3		36.8		48.5		23.4	0	376.5	
1	4	Non-acad.,in Honduras, not ESNACIFOR				9.5		20.9		20.9		20.9		18.4		18.4		0.5	0	109.4	
		TOTAL FOREST MANAGEMENT OF SELECTED AREAS				621.3		1040.3		1004.9		1172.6		969.4		743.9		551.5		6303.8	
		STRENGTHENING OF FOREST INDUSTRY																			
		OUTPUT 10 + 11 -- Improved Timer Utilization																			
1	3	Sawmill Expert	pm	10.00	3	30.0	12	120.0	9	90.0		0.0		0.0		0.0		0.0	24	240.0	
1	3	Consultants - short term	pm	10.00		0.0	6	60.0	6	60.0	6	60.0		0.0		0.0		0.0	18	180.0	
2	4	Advisor to AMADHO	pm	3.13	6	18.8	12	37.6	12	37.6		0.0		0.0		0.0		0.0	30	93.9	

FORESTRY DEVELOPMENT PROJECT (522-0246) -- AID DISBURSEMENT PLAN

-CODE-- G/L 1/2	$/Lemp 3/4	ITEM	UNIT	COST/ UNIT US$000	YEAR 1 NO. UNITS	YEAR 1 COST/ YEAR US$000	YEAR 2 NO. UNITS	YEAR 2 COST/ YEAR US$000	YEAR 3 NO. UNITS	YEAR 3 COST/ YEAR US$000	YEAR 4 NO. UNITS	YEAR 4 COST/ YEAR US$000	YEAR 5 NO. UNITS	YEAR 5 COST/ YEAR US$000	YEAR 6 NO. UNITS	YEAR 6 COST/ YEAR US$000	YEAR 7 NO. UNITS	YEAR 7 COST/ YEAR US$000	TOTAL NO. UNITS	TOTAL PROJECT COST US$000	Explanation of line items (Will not be printed in final version. For reference only)
1	3	Product/Market studies, AMADHO				0.0		30.0		30.0		0.0		0.0		0.0		[illegible]	0	60.0	
1	4	Wood Promotion - AMADHO				0.0		8.0		0.0		0.0		0.0		0.0		0.0	0	8.0	
1	3	Computer for AMADHO				6.9		0.0		0.0		0.0		0.0		0.0		0.0	0	6.9	
1	3	Vehicles 4WD for AMADHO				15.0		0.0		0.0		0.0		0.0		0.0		0.0	1	15.0	
2	3	Vehicles pick-up 4WD, light	number	12.00		12.0		0.0		12.0		0.0	1	12.0		0.0		0.0	3	36.0	
2	3	Vehicles pick-up 4WD, heavy	number	16.00		16.0		0.0		0.0		0.0	1	16.0		0.0		0.0	2	32.0	
2	3	Equipment & materials				4.0		2.0		2.0		2.0		2.0		2.0		2.0	0	16.0	
2	4	Publication of manuals				0.0		1.0		1.0		1.0		1.0		1.0		1.0	0	6.0	
		OUTPUT 12 -- Financing for industry																			
2	3	Credit for forest industry(FI)				250.0		500.0		1000.0		1250.0		0.0		0.0		0.0	0	3000.0	
2	4	Credit for forest industry(LC)				200.0		400.0		500.0		800.0		0.0		0.0		0.0	0	1900.0	
		TRAINING FOR STRENGTHENING FOREST INDUSTRY																			
1	3	Non-academic outside Honduras				0.0		115.6		115.6		39.2		0.0		0.0		0.0	0	270.5	
1	4	Non-academic at ESNACIFOR				13.4		37.0		37.0		37.0		10.1		3.4		3.4	0	141.3	
		TOTAL STRENGTHENING OF FOREST INDUSTRY				566.1		1311.2		1835.2		2139.2		41.1		6.4		6.4		6005.6	
		ADMINISTRATION																			
1	3	USAID Project Officer	pm	10.00	6	60.0	6	60.0	6	60.0	6	60.0	6	60.0	6	60.0	6	60.0	42	420.0	Budgeted half time
1	4	Training Coordinator	pm	1.86	12	22.3	12	22.3	12	22.3	12	22.3		0.0		0.0		0.0	48	89.3	See training annex
1	3	Evaluations				0.0		0.0	1	40.0		0.0	1	40.0		0.0	1	45.0	3	125.0	
1	3	Audits	number	25.00		0.0		0.0	1	25.0		0.0	1	25.0		0.0	1	25.0	3	75.0	
1	3	Analysis of Forest Practices				40.0		0.0		0.0		0.0		0.0		0.0		0.0	0	40.0	
2	3	Vehicles pick-up 4WD, light	number	12.00	2	24.0		0.0	0	0.0		0.0	2	24.0		0.0		0.0	4	48.0	
2	3	Vehicle O & M	veh.-mo	0.40	12	4.8	24	9.6	24	9.6	24	9.6	24	9.6	24	9.6	24	9.6	156	62.4	
1	4	Furnitures & appliances for TA				60.0		0.0		0.0		0.0		0.0		0.0		0.0	0	60.0	
		TOTAL ADMINISTRATION				211.1		91.9		156.9		91.9		158.6		69.6		139.6		919.7	
		Total Grant				1116.7		2069.9		2079.4		1265.6		748.8		439.7		279.0		8000.0	
		Total Loan				1422.2		1420.5		2405.6		2869.8		780.8		754.4		490.0		10142.3	
		PROJECT SUBTOTAL				2538.9		3490.4		4485.0		4134.4		1529.6		1194.1		769.8		18142.3	
		INFLATION & CONTINGENCY (10%)				253.9		349.0		472.0		433.4		153.0		119.4		77.0		1857.7	
		PROJECT TOTAL				2792.8		3839.5		4957.0		4567.8		1682.6		1313.5		846.8		20000.0	

EXHIBIT 8

FORESTRY DEVELOPMENT PROJECT (522-0246) -- Budget for Technical Assistance to Campesinos through NGO

S/LS/Leap 1/2S/4	ITEM	UNIT	COST/ UNIT US$000	YEAR 1 NO. UNITS	YEAR 1 COST/ YEAR US$000	YEAR 2 NO. UNITS	YEAR 2 COST/ YEAR US$000	YEAR 3 NO. UNITS	YEAR 3 COST/ YEAR US$000	YEAR 4 NO. UNITS	YEAR 4 COST/ YEAR US$000	YEAR 5 NO. UNITS	YEAR 5 COST/ YEAR US$000	YEAR 6 NO. UNITS	YEAR 6 COST/ YEAR US$000	YEAR 7 NO. UNITS	YEAR 7 COST/ YEAR US$000	TOTAL NO. UNITS	TOTAL PROJECT COST US$000	
1 3	Small industries spec.-internl.	pm	3.00	6	18.0	12	36.0	12	36.0	6	18.0		0.0		0.0		0.0	36	108.0	
1 3	Logging specialist	pm	3.00	6	18.0	12	36.0	6	18.0		0.0		0.0	2	6.0		0.0	26	78.0	
1 4	Small industries spec.- local	pm	1.00	3	3.0	12	12.0	12	12.0	12	12.0	12	12.0	12	12.0	12	12.0	75	75.0	
1 4	Small business magt.specialist	pm	1.00		0.0	9	9.0	12	12.0	12	12.0	6	6.0	2	2.0		0.0	41	41.0	
1 4	Social promotor	pm	0.75	6	4.5	12	9.0	12	9.0	12	9.0		0.0		0.0		0.0	42	31.5	
1 4	Forest technician	pm	0.75		0.0	6	4.5	12	9.0	24	18.0	24	18.0	24	18.0		0.0	90	67.5	
1 3	Consultants industry&logging	pm	4.00		0.0		0.0	3	12.0	3	12.0	4	16.0	4	16.0	4	16.0	18	72.0	
1 4	Per diem				3.2		9.5		10.4		10.4		6.9		6.6		2.4	0	49.2	$30/day * 5days/pm
1 4	Group Extension for campesinos	number	3.00	2	6.0	5	15.0	8	24.0	5	15.0	5	15.0		0.0		0.0	25	75.0	
1 3	Vehicles 4WD	number	12.00	2	24.0	1	12.0		0.0		24.0	2	24.0		0.0		0.0	5	84.0	
1 4	Vehicle O & M	veh.-mo	0.40	12	4.8	36	14.4	36	14.4	36	14.4	24	9.6	24	9.6	12	4.8	180	72.0	$400/mo/vehicle
1 4	Office rent & maintainance				1.0		2.0		2.0		2.0		2.0		0.0		0.0	0	9.0	
1 4	Office furniture & equipment				5.0		0.0		0.0		0.0		0.0		0.0		0.0	0	5.0	
1 3	Tools & equip.for field tests				5.0		30.0		40.0		10.0		2.0		0.0		0.0	0	87.0	
1 3	Materials				2.0		5.0		2.0		2.0		2.0		1.0		1.0	0	15.0	
1 4	Communications				1.0		3.0		3.0		3.0		1.0		1.0		1.0	0	13.0	
	SUBTOTAL				95.5		197.4		203.8		161.8		114.5		72.2		37.2	0	882.2	
	Overhead (35 %)				33.4		69.1		71.3		56.6		40.1		25.3		13.0		308.8	
	INFLATION & CONTINGENCY (10%)				12.9		26.6		27.5		21.8		15.5		9.7		5.0		119.1	
	TOTAL				141.7		293.1		302.6		240.2		170.0		107.2		55.2		1310.1	

Exhibit 8

FORESTRY DEVELOPMENT PROJECT (522-0246) -- DETAILED BUDGET FOR GOH

-CODE-- In-Kind = 1 Financial = 2	ITEM	UNIT	COST/ UNIT US$000	YEAR 1 NO. UNITS	YEAR 1 COST/ YEAR US$000	YEAR 2 NO. UNITS	YEAR 2 COST/ YEAR US$000	YEAR 3 NO. UNITS	YEAR 3 COST/ YEAR US$000	YEAR 4 NO. UNITS	YEAR 4 COST/ YEAR US$000	YEAR 5 NO. UNITS	YEAR 5 COST/ YEAR US$000	YEAR 6 NO. UNITS	YEAR 6 COST/ YEAR US$000	YEAR 7 NO. UNITS	YEAR 7 COST/ YEAR US$000	TOTAL NO. UNITS	TOTAL PROJECT COST US$000	Explanation of line items (Will not be printed in final version. For reference only)
1	ESNACIFOR saw filing shop				0.0		162.5		0.0		0.0		0.0		0.0		0.0	0	162.5	Value of ESNACIFOR saw filing shop
2	Vehicle O & M	veh.-mo	0.40	12	4.8	24	9.6	36	14.4	36	14.4	36	14.4	24	9.6	12	4.8	180	72.0	
2	Travel & per diem for TA Unit				3.0		7.0		10.0		10.0		3.0		3.0		3.0		39.0	
	OUTPUT 12 -- Financing for Industry																			
	TOTAL STRENGTHENING OF FOREST INDUSTRY				34.2		402.7		112		112		105		100.2		95.4		961.5	
	ADMINISTRATION																			
1	Project Director	pm	3.13	12	37.6	12	37.6	12	37.6	12	37.6	12	37.6	12	37.6	12	37.6	84	262.9	
1	Environmental Review Officer	pm	1.88	12	22.6	12	22.6	12	22.6	12	22.6	12	22.6	12	22.6	12	22.6	84	158.2	
1	Admin. Assistant	pm	1.25	12	15.0	12	15.0	12	15.0	12	15.0	12	15.0	12	15.0	12	15.0	84	105.0	
2	Bilingual Secretary	pm	0.75	12	9.0	12	9.0	12	9.0	12	9.0	12	9.0	12	9.0	12	9.0	84	63.0	
1	Office rent & maintainance	month	0.30	8	2.4	12	3.6	12	3.6	12	3.6	12	3.6	12	3.6	12	3.6	80	24.0	
2	Office Equipment				2.0		4.0		2.0		0.0		0.0		0.0		0.0	0	8.0	
2	Office Supplies	month	0.50	8	4.0	12	6.0	12	6.0	12	6.0	12	6.0	12	6.0	12	6.0	80	40.0	
	TOTAL ADMINISTRATION				92.6		97.7		95.8		93.8		93.8		93.8		93.8		661.1	
	Total In-Kind				443.8		839.2		534.2		566.8		559.3		579.3		559.3		4081.9	
	Total Financial				375.6		597.7		806.3		1049.4		1147.1		1283.5		1284.0		6543.3	
	PROJECT SUBTOTAL				819.4		1436.9		1340.4		1616.2		1706.4		1862.7		1843.3		10625.2	
	INFLATION & CONTINGENCIES (10%)				81.9		143.7		134.0		161.6		170.6		186.3		184.3		1062.5	
	PROJECT TOTAL				901.3		1580.6		1474.5		1777.8		1877.0		2049.0		2027.7		11687.7	

FORESTRY DEVELOPMENT PROJECT (522-0246) -- GOH Disbursement Plan

FORESTRY DEVELOPMENT PROJECT (522-0246) -- DETAILED BUDGET FOR GOH

-CODE-- In-Kind = 1 Financial = 2	ITEM	UNIT	COST/ UNIT US$000	YEAR 1 NO. UNITS	YEAR 1 COST/ YEAR US$000	YEAR 2 NO. UNITS	YEAR 2 COST/ YEAR US$000	YEAR 3 NO. UNITS	YEAR 3 COST/ YEAR US$000	YEAR 4 NO. UNITS	YEAR 4 COST/ YEAR US$000	YEAR 5 NO. UNITS	YEAR 5 COST/ YEAR US$000	YEAR 6 NO. UNITS	YEAR 6 COST/ YEAR US$000	YEAR 7 NO. UNITS	YEAR 7 COST/ YEAR US$000	TOTAL NO. UNITS	TOTAL PROJECT COST US$000	Explanation of line items (Will not be printed in final version. For reference only)
2	Road maintenance-by hand	km	1.50	36	54.0	38	57.0	47	70.5	97	145.5	118	177.0	146	219.0	179	268.5	661	991.5	Type A roads maching, 82km exist
	OUTPUT 7 -- Sites Regenerated																			
1	Forest Camp & Off. La Union			1	100.0		0.0		0.0		0.0		0.0		0.0		0.0	1	100.0	
1	Studies AREAS II-III				0.0		0.0	1	20.0		0.0		0.0	1	20.0		0.0	2	40.0	
1	Environmental Research				0.0		10.0		15.0		0.0		0.0		0.0		0.0	0	25.0	
1	Chief La Union Mgt. Unit	pa	2.50	6	15.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	78	195.0	
1	Chief For.Mgt.Unit II	pa	1.88		0.0	0	0.0	0	0.0	12	22.6	12	22.6	12	22.6	12	22.6	48	90.2	
1	Forest Manager/Silviculturist	pa	1.00		0.0	12	12.0	12	12.0	24	24.0	24	24.0	24	24.0	24	24.0	120	120.0	
2	Administrator	pa	1.00	12	12.0	12	12.0	12	12.0	24	24.0	24	24.0	24	24.0	24	24.0	120	120.0	
2	Secretary	pa	0.55	12	6.6	12	6.6	12	6.6	24	13.2	24	13.2	24	13.2	24	13.2	132	132.0	
1	Office assistant	pa	0.13	12	1.6	12	1.6	12	1.6	24	3.1	24	3.1	24	3.1	24	3.1	132	17.2	
2	Guard	pa	0.13	12	1.6	24	3.1	24	3.1	48	6.2	48	6.2	48	6.2	48	6.2	252	32.8	
2	Mechanic	pa	0.63		0.0	12	7.6	12	7.6	24	15.1	24	15.1	24	15.1	24	15.1	120	75.6	
2	Mechanic assistant	pa	0.38		0.0	12	4.6	12	4.6	24	9.1	24	9.1	24	9.1	24	9.1	120	45.6	
2	Warehouse keeper	pa	0.25		0.0	12	3.0	12	3.0	24	6.0	24	6.0	24	6.0	24	6.0	120	30.0	
2	Nurseryman	pa	0.25		0.0		0.0		0.0	12	3.0	12	3.0	12	3.0	12	3.0	48	12.0	
2	Laborers	pa	0.13		0.0	183	24.4	240	31.2	442	57.5	494	64.2	508	66.1	508	66.1	2380	309.3	
2	Vehicle O & M	veh.-mo	0.40	12	4.8	48	19.2	48	19.2	96	38.4	96	38.4	96	38.4	96	38.4	372	196.8	
	OUTPUT 8 -- Income from Forests for Local Population																			
	OUTPUT 9 -- Improved Agriculture & Grazing																			
2	Chief Ag. Unit La Union	pa	1.86	9	16.7	12	22.3	12	22.3	12	22.3	12	22.3	12	22.3	12	22.3	81	150.7	
2	Ag. Ext. Agents (Agronomos)	pa	0.65	6	3.9	12	7.8	36	23.4	36	23.4	48	31.2	48	31.2	48	31.2	234	152.1	
2	Range Mgt. Ext. Agents	pa	0.65	6	3.9	12	7.8	36	23.4	36	23.4	48	31.2	48	31.2	48	31.2	234	152.1	
2	Home Econ. Ext. (Prom. Social)	pa	0.65	6	3.9	12	7.8	36	23.4	36	23.4	48	31.2	48	31.2	48	31.2	234	152.1	
2	Ag. Para-technicians	pa	0.35		0.0	0	0.0	72	25.2	72	25.2	96	33.6	96	33.6	96	33.6	432	151.2	
2	Credit Manager	pa	0.63		0.0	0	0.0	12	7.6	12	7.6	12	7.6	12	7.6	12	7.6	60	37.8	
2	Office furniture	set	0.20	4	0.8		0.0	3	0.6	4	0.8	3	0.6		0.0		0.0	14	2.8	Basic set furniture for each person =$200
2	Office supplies	$/pa	0.02	24	0.5	48	1.0	86	1.7	110	2.2	134	2.7	134	2.7	134	2.7	670	13.4	Supplies/person/month =$20
2	Credit for crops & cattle	no.farm	0.70	15	10.5	30	21.0	60	42.0	120	84.0	160	112.0	210	147.0	210	147.0	805	563.5	
2	Vehicle O & M	veh.-mo	0.40	12	4.8	24	9.6	36	14.4	60	24.0	72	28.8	72	28.8	72	28.8	348	139.2	
2	Motorcycle O & M	veh.-mo	0.20		0.0	24	4.8	24	4.8	48	9.6	48	9.6	48	9.6	48	9.6	240	48.0	
2	Per diem national personnel	days	0.03	50	1.5	100	3.0	175	5.3	275	8.3	350	10.5	350	10.5	350	10.5	1650	49.5	
	TOTAL FOREST MANAGEMENT OF SELECTED AREAS				371.3		400.6		604.4		874.6		979.3		1140.4		1125.8		5496.4	
	STRENGTHENING OF FOREST INDUSTRY																			
	OUTPUT 10 + 11 -- Improved Timber Utilization																			
2	Chief Forest Ind. TA Unit	pa	2.50	8	20.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	80	200.0	
2	For.Industry Technicians	pa	1.00		0.0	24	24.0	48	48.0	48	48.0	48	48.0	48	48.0	48	48.0	264	264.0	
2	Secretary	pa	0.50	8	4.0	12	6.0	12	6.0	12	6.0	12	6.0	12	6.0	12	6.0	80	40.0	
1	Office rent & maintainance	month	0.30	8	2.4	12	3.6	12	3.6	12	3.6	12	3.6	12	3.6	12	3.6	80	24.0	
1	ESNACIFOR sawmill				0.0		160.0		0.0		0.0		0.0		0.0		0.0	0	160.0	Value of mill + locomovil

Lotus 01-Jan-85 LOTUS BUDGOH3.WKS

Note: Minor differences in cross check of sums is due to rounding off for the printout.

Exhibit 8

FORESTRY DEVELOPMENT PROJECT (522-0246) -- DETAILED BUDGET FOR GOH

-CODE-- In-kind = 1 Financial = 2	ITEM	UNIT	COST/ UNIT US$000	YEAR 1 NO. UNITS	YEAR 1 COST/ YEAR US$000	YEAR 2 NO. UNITS	YEAR 2 COST/ YEAR US$000	YEAR 3 NO. UNITS	YEAR 3 COST/ YEAR US$000	YEAR 4 NO. UNITS	YEAR 4 COST/ YEAR US$000	YEAR 5 NO. UNITS	YEAR 5 COST/ YEAR US$000	YEAR 6 NO. UNITS	YEAR 6 COST/ YEAR US$000	YEAR 7 NO. UNITS	YEAR 7 COST/ YEAR US$000	TOTAL NO. UNITS	TOTAL PROJECT COST US$000	Explanation of line items (Will not be printed in final version. For reference only)
	REORIENTATION OF COHDEFOR																			
	OUTPUT 1 -- Stumpage Sale & Valuation																			
1	Chief Timber Sales Unit	pm	2.50	6	15.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	78	195.0	
1	Logging Expert	pm	2.50		0.0	3	7.5		0.0	3	7.5		0.0		0.0		0.0	6	15.0	
1	Timber sale crews(3 pers.each)	crew-yr	18.00	1	18.0	5	90.0	5	90.0	5	90.0	5	90.0	5	90.0	5	90.0	31	558.0	
2	Timber sale crews(3 pers.each)	crew-yr	18.00	0	0.0	5	90.0	5	90.0	5	90.0	5	90.0	5	90.0	5	90.0	30	540.0	
1	Logging Supervision Tech.	pm	0.50	42	21.0	84	42.0	84	42.0	84	42.0	84	42.0	84	42.0	84	42.0	546	273.0	
2	INFONAC timber sale crew	crew-yr	18.00	1	9.0	1	18.0	1	18.0	1	18.0	1	18.0	1	18.0	1	18.0	7	117.0	
1	INFONAC Office Staff (50%)				95.0		95.0		95.0		95.0		95.0		95.0		95.0	0	665.0	
2	Vehicle O & M	veh.-mo	0.40	228	91.2	228	91.2	228	91.2	228	91.2	228	91.2	228	91.2	228	91.2	1596	638.4	$... /mo/vehicle
	OUTPUT 2 -- Lumber Export Control																			
1	Market Analyst (50%)	pm	1.25	12	15.0	12	15.0	12	15.0	12	15.0	12	15.0	12	15.0	12	15.0	84	105.0	
1	Export Documentation Spec. (50%)	pm	0.94	12	11.3	12	11.3	12	11.3	12	11.3	12	11.3	12	11.3	12	11.3	84	79.0	
1	Quality Control. Spec. (50%)	pm	0.94	12	11.3	12	11.3	12	11.3	12	11.3	12	11.3	12	11.3	12	11.3	84	79.0	
2	Bilingual Secretary (50%)	pm	0.38	12	4.6	12	4.6	12	4.6	12	4.6	12	4.6	12	4.6	12	4.6	84	31.9	
	OUTPUT 3 -- COHDEFOR's Efficiency																			
1	Management Specialist	pm	2.50	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	12	30.0	84	210.0	
	TOTAL REORIENTATION OF COHDEFOR				321.3		535.6		528.3		535.8		528.3		528.3		528.3		3506.2	
	FOREST MANAGEMENT OF SELECTED AREAS																			
	OUTPUT 4 -- Forest Management Plans																			
2	Chief For.Mgt.Design Team	pm	1.88	12	22.6		0.0	12	22.6		0.0		0.0	12	22.6		0.0	36	67.7	
2	Forest Manager/Silviculturist	pm	1.00	12	12.0		0.0	12	12.0		0.0		0.0	12	24.0		0.0	36	48.0	
2	Aerial photo interpreter	pm	0.75	6	4.5		0.0	6	4.5		0.0		0.0		0.0		0.0	12	9.0	
2	Vehicle O & M	veh.-mo	0.40	6	2.4		0.0		0.0		0.0		0.0		0.0		0.0	6	2.4	
	OUTPUT 5 -- Forest Protection																			
1	Technician forest protection	pm	1.00	8	8.0	12	12.0	12	12.0	24	24.0	24	24.0	24	24.0	24	24.0	128	128.0	Sueldo + costos sociales =$600+$100
1	Fire brigade foreman(permanent)	pm	0.25	16	4.0	24	6.0	24	6.0	24	6.0	24	6.0	24	6.0	24	6.0	160	40.0	Sueldo + costos sociales
2	Fire brigade foreman(permanent)	pm	0.25	0	0.0	0	0.0	0	0.0	24	6.0	24	6.0	24	6.0	24	6.0	96	24.0	Sueldo + costos sociales
2	Fire brigade foreman (temp.)	pm	0.25	10	2.5	10	2.5	10	2.5	20	5.0	20	5.0	20	5.0	20	5.0	110	27.5	Sueldo + costos sociales
2	Fire lookout	pm	0.13	8	1.0	16	2.1	24	3.1	40	5.2	48	6.2	56	7.3	64	8.3	256	33.3	Sueldo + costos sociales
2	Roving fire patrol	pm	0.13	36	4.7	48	6.2	60	7.8	108	14.0	144	18.7	156	20.3	168	21.8	720	93.6	Sueldo + costos sociales
1	Laborers	pm	0.13	144	18.7	144	18.7	144	18.7	144	18.7	144	18.7	144	18.7	144	18.7	1008	131.0	Sueldo + costos sociales
2	Laborers	pm	0.13	0	0.0	0	0.0	48	6.2	240	31.2	240	31.2	288	37.4	336	43.7	1152	149.8	Sueldo + costos sociales
2	Drivers	pm	0.25	18	4.5	18	4.5	30	7.5	54	13.5	54	13.5	66	16.5	72	18.0	312	78.0	Sueldo + costos sociales
2	Tower construction				4.0		4.0		5.0		6.5		4.0		5.0		2.5	0	31.0	
2	Materials				2.5		4.0		5.0		8.5		11.5		12.5		13.5	0	57.5	
2	Fire fighting overtime				6.0		6.5		8.5		15.5		16.5		19.0		20.5	0	92.5	
2	Vehicle O & M	veh.-mo	0.40	12	4.8	36	14.4	48	19.2	72	28.8	72	28.8	72	28.8	72	28.8	384	153.6	
	OUTPUT 6 -- Forest Roads																			
2	Civil Engineer	pm	1.88	12	22.6	12	22.6	9	16.9	6	11.3	3	5.6	3	5.6		0.0	45	84.6	
2	Surveyor	pm	0.75	6	4.5	12	9.0	6	4.5	6	4.5	3	2.3	3	2.3		0.0	36	27.0	

Note: Minor differences in cross check of sums is due to rounding off for the printout.

3. SUMMARY COST ESTIMATE AND FINANCIAL PLAN
METHODS OF IMPLEMENTATION AND FINANCING
($000)

FORESTRY DEVELOPMENT PROJECT (522-0246)

METHOD OF IMPLEMENTATION	METHOD OF FINANCING	APPROXIMATE AMOUNT
TECHNICAL ASSISTANCE		
Direct Personal Services Contractor	Direct Payment	2,058.9
Pasa	Direct Payment	420.0
PVO	Direct Payment	1,310.0
TRAINING		
Non-Profit Contractor	Direct Payment	1,909.3
Host Country Contract	Direct Reimbursement	1,951.9
COMMODITIES		
Direct Profit Making Contractor	Direct Reimbursement	1,177.3
Host Country Profit making contractor	Direct Payment	330.6
EVALUATION AND AUDITS		
Direct Personnel Service Contractor and/or Contract Personnel Services Contractor	Direct Payment or Direct Reimbursement	200.0
	Direct Payment	330.6
CREDIT FUNDS		
Host Country Private Banks (BANADESA)	Direct Reimbursement	4,900.0
Host Country Administration	Direct Reimbursement	850.0
CONSTRUCTION		
Host Country profit making contractor	Direct Reibursement	2,443.0
OTHER COSTS		
Local Support Cost	Direct Payment	589.4
Host Country Inflation & Contingencies	Direct Reimbursement	1,814.0
TOTAL PROJECT		$ 19,954.4

The Mission will be using the financing methods of direct payment and reimbursement that are in accordance with the A.I.D. preferred modes of payment.

4. Justification for PASA USDA/U.S. Forest Service

USAID/Honduras is in the process of developing a forestry project with the Government of Honduras. The project concentrates on the pine resource of Honduras and contains three components:

1. Financial and managerial strengthening of COHDEFOR;
2. Forest management of specific areas;
3. Financial and technical assistance to the forest industry;

The technical assistance requirements are concentrated in the areas of timber sales, stumpage appraisal, forest management, sawmill efficiency and public administration.

The project will use 4 long-term contractors for a total of 102 person months (p.m.) and 75 p.m. of short-term technical assistance. Of the long term contractors, two will be in the area of timber sales and stumpage appraisal, one in sawmill efficiency and one in public administration.

The Project Development Committee has determined that it is in the best interest of the Forestry Project to obtain technical assistance which the Agency does not have through a Participating Agency Service Agreement (PASA) with the USDA/Forest Service (FS). The GOH implementing agency, COHDEFOR has also determined that the FS would be the most suitable provider of technical assistance.

Section 621(a) of the Foreign Assistance Act (FAA) presents guidelines for the use of PASA's. The criteria of Section 621(a) can be met in this case. First, there is no question that the nature of the assistance is technical in nature. Regarding this condition, the USDA Forest Service has been consulted and the agency has expressed its desire to carry out the technical assistance and its ability to carry out this activity without interfering with its domestic program.

The second condition requires that the resources and facilities of the proposed Participating Agency be particularly or uniquely suitable to the technical assistance to be provided. The USDA Forest Service meets thiscondition due to the following reasons:

a) In the areas of timber valuation and timber sales, the U.S. Forest Service (USFS) is particularly suited since the USFS carries out the valuation of stumpage and the oversight of timber sales on vast tracts of public land similar to those to be placed under a revised valuation system in Honduras. The USFS annually sells about 11 billion board feet of timber from National Forests.

b) In institutional strengthening, the USFS and allied institutions at state and university levels have a wealth of experience that is simply not available in the private sector. USFS experts know from experience what it takes to administer a complex institution charged with forest management on state and national scales. From 1981 to 1984, the USFS went through the process of streamlining itself and this particular experience will help to support CODEFOR in its own restructuring.

c) In the area of forest management, the USFS technical resources would be the most qualified. The USFS is directly involved in forest management in all states and Puerto Rico, and has substantial experience in other tropical areas as well.

The Forest Service is one of the world's largest wildland fire fighting forces. The USFS activities include fire suppression efforts similar to those the project will carry out such as building firebreaks and access roads and conducting controlled burns.

In forest pest management, the USFS carries out prevention and suppression on National Forest Lands and provides technical and financial assistance and coordination to support these activities on state and private forest lands.

In range management, the Forest Service manages more than 14 percent of the U.S. forest range conserving the land and vegetation while providing forage for domestic livestock and wildlife.

In addition, the USFS can access Land Grant University Systems and State Level Forest Services to provide additional in-house expertise at all levels and in all areas of forest management. This depth and breadth of expertise is not available from any private company or single university.

d) In the area of technical assistance to the forest industry, again, the USFS (and cooperating U.S. Land Grant Universities) has particularly suitable qualifications.

The USDA Forest Service, in cooperation with state forestry agencies and the wood products industry, operates a Sawmill Improvement Program. The program was designed as a technology transfer process to achieve more efficient processing by the sawmill industry. Since the beginning of the program in 1973, more than 1,000 mills that comprise about 60 percent of the U.S. softwood lumber production have used the program.

The U.S. Forest Products Laboratory in Madison, Wisconsin is the world's largest and most influential wood research institution with an annual budget of around $12 million. No private company could match such a resource.

Additionally, the USFS and readily accessible Title XII University staff are well versed in the most up-to-date technologies and experienced in transfer of technology to private sector entities.

e) A PASA with USDA/USFS would not only provide the best T.A. resources for the short-term interests of project implementation, but it would serve to establish a close working relationship between the forest services of Honduras and the U.S. which would provide lasting benefits to Honduras well beyond the PACD. Such a relationship will undoubtedly create many opportunities for unforseen spin-offs.

f) The USDA/USFS is not competitive with private enterprise in this case, since, as discussed above, the capabilities of the USFS in providing this highly specialized TA are particularly suitable. Private enterprise does not manage U.S. public forest reserves and does not possess in-house the kinds of expertise required to implement this project.

AUTHORITY: The policies contained in A.I.D. Handbook 12, Use of Federal Agencies provide you authority to enter into PASAs.

Section 632(b) of the Foreign Assistance Act of 1961 (FAA) is the general authority to enter into PASAs and RSSAs. Section 632(b) states that "Any officer of the United States Government carrying out functions under this Act may utilize the services...and facilities of, or procure commodities...from, any agency of the United States Government as the President shall direct, or with the consent of the head of such agency..."

OMB Circular A-76 (March 29, 1979) provides certain criteria by which an agency may utilize another agency for the purposes of providing technical assistance. However, if it can be shown that the request to the participating agency is for technical assistance, and that the resources and facilities of that Agency are particularly or uniquely suitable for the technical assistance being provided, that the activities would be neither competitive with private enterprise nor would unlikely interfere with USDA's domestic programs, then the criteria in OMB Circular A-76 must not be met.

Specifically, Section 621(a) of the FAA provides that: "In such fields as education, health, housing or agriculture the facilities and resources of other Federal agencies shall be utilized, when such facilities are particularly or uniquely suitable for technical assistance, are not competitive with private enterprise, and can be made available without interfering unduly with domestic programs."

RECOMMENDATION: That pursuant to Handbook 12 you find that the proposed agreement with the USDA Forest Service to provide the technical assistance to the Forestry Development Project is exempt from OMB Circular A-76 because (1) it is for the provision of technical assistance, and (2) the facilities and resources of USDA/USFS are particularly or uniquely suitable for the technical assistance to be provided and are not competitive with U.S. private enterprises.

Approved John Sanbrailo

Disapproved _____

Date 12/18/87

5. Project Outputs

It is anticipated that by the end of the project (the PACD), the following will have been accomplished:

Project Component

- Institutional Strenthening of COHDEFOR

  - A new stumpage sale and valuation system will be in place, and all commercial lumber transactions will be made according to this system.

  - All lumber exports will be handled and negotiated by the private sector, with an appropriate sales commission acruing to the national government.

  - COHDEFOR will become self-sufficient.

  - COHDEFOR will be a well managed, efficient organization which will function according to standardized operating procedures.

- Forest Management of Selected Areas

  - Forest management being carried out according to a rational forest management plan in La Unión and a second area (Area 2) to be selected in year four of the project.

- A system of fire protection, pest control, and better soil conservation, range management and agroforestry practices in place and operational in La Unión and Area 2.

- An improved and expanded network of forest roads in La Unión and Area 2.

- Artificial and natural pine regeneration of logged and understocked sites in La Unión and Area 2.

- Local population of La Unión and Area 2 deriving a significant and sustained income from forest based industries and activities.

- Strengthening of the Forest Industry

  - Forest industry using the standing timber volume through new economically sound and technically efficient logging and residue-use methods introduced under the project.

  - Upgraded and more efficient forest utilization being carried out by the sawmill industry.

  - Sustainable private banking sector involvement in forest industry lending.

IV. Project Implementation Arrangements

A. Project Organization

Exhibit No. 9 describes the overall organization of the project. The project will be implemented by two groups of entities: the public sector agencies (on the left side of the figure) of which COHDEFOR carries the largest responsibility and the private sector institutions (on the right side) of which the main ones are financial entities.

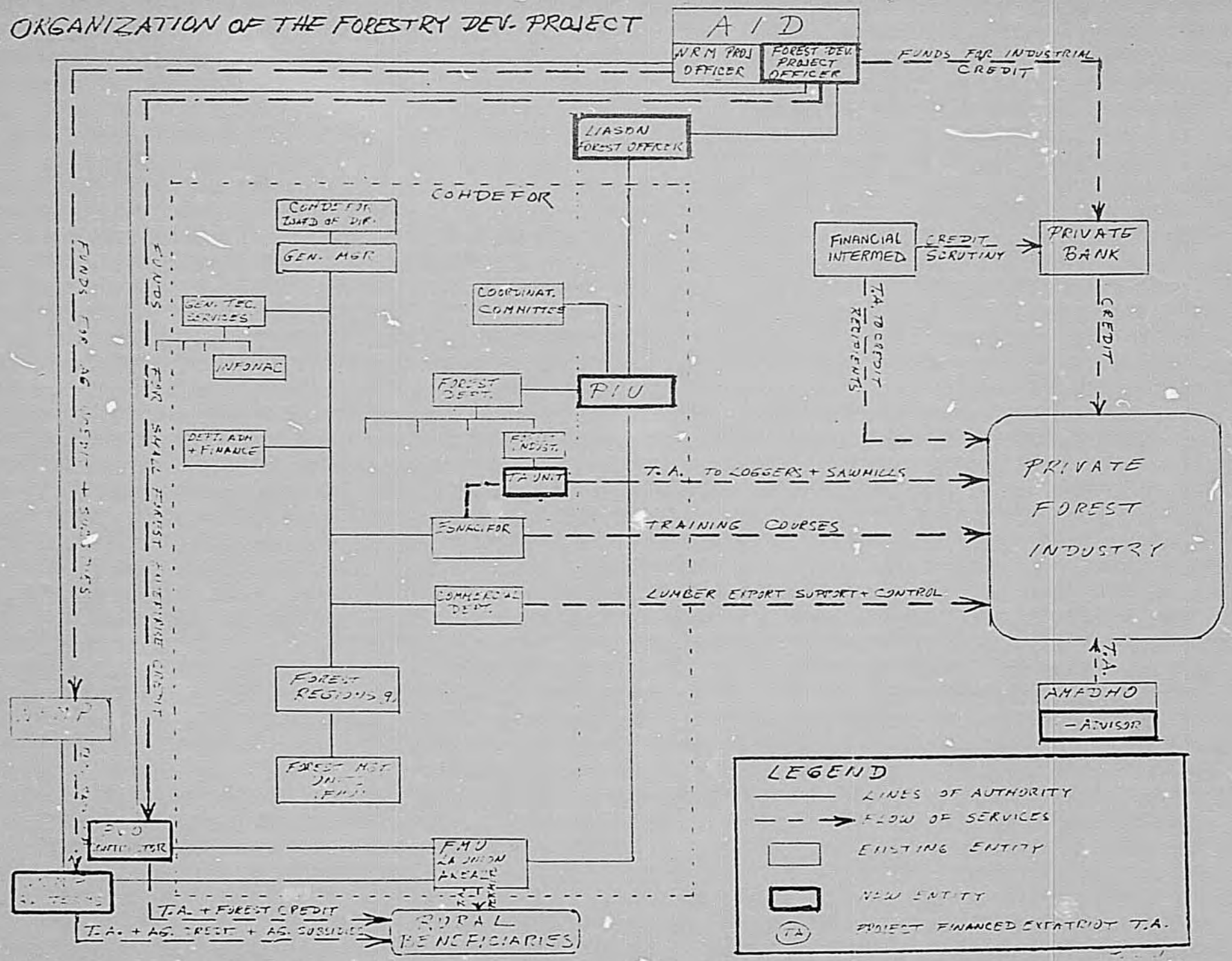
COHDEFOR will be the lead GOH counterpart agency for this project and will be responsible for overseeing, coordinating and in some instances executing project activities. The Corporation will prepare annual work plans and budgets, in coordination with other executing agencies (Ministry of Natural Resources and the Project PVO) for presentation to USAID.

In addition, COHDEFOR will be responsible for providing personnel needed to carry out the project as indicated in the Implementation Plan and the Project Budget. Any new personnel contracted by COHDEFOR to implement the project, will be contracted using USAID host country contracting procedures.

The project will operate through the existing COHDEFOR structure, not create new entities inside it. It is felt that this is the best means to strengthen the institution and to assure continuity after termination of the project. The only exceptions are the creation of a Project Implementation Unit to expedite project administrative matters and a Forest Industries Technical Assistance Unit (both described below).

EXHIBIT 9

ORGANIZATION OF THE FORESTRY DEV. PROJECT



B. GOH Entities Involved In Project Implementation

1. Project Implementation Unit

A Project Implementation Unit (PIU) will be created in COHDEFOR to serve as a focal point for all Corporation related administrative matters of this project. The PIU will be composed of a Director and at least two assistants, one technical and one administrative.

The PIU will be attached to the Forest Department and the Chief of that department will be the supervisor of the Director of the PIU. However, the PIU will receive guidance from, and be responsible to, a Coordinating Commitee made up of the heads of the five COHDEFOR departments (Forestry, Planning, Administration and Finance, Commerce and Training) in order to assure responsiveness of the entire Corporation. The Director of the PIU will have the authority to call meetings whenever necessary and to determine the agenda. The PIU will have authority over the La Unión and area 2 Forest Management Units. Communications with USAID will flow primarily through the Mission's Forestry Liaison Officer.

A Condition Precedent to Subsequent Disbursement will assure that the PIU is created in an expedient manner, established and staffed within 120 days of the signing of the Project Agreement. It will prepare annual operating plans in coordination with other participating entities within COHDEFOR for presentation to the Ministry of Finance and Public Credit and USAID for review and approval. A further task of the Unit will be to coordinate all COHDEFOR project funded procurement tasks. This will include collaboration in the preparation of terms of reference for short-term TA and the formulation of specifications for commodities. Refinement of the project training plan will also be the responsibility of the PIU -- a task it will carry out in conjunction with ESNACIFOR and other COHDEFOR units. Finally, the PIU will have overall responsibility for coordinating project evaluation activities.

2. COHDEFOR Units Responsible for Stumpage Sale and Valuation

a. INFONAC

INFONAC, the National Forest Inventories Unit, is the section of COHDEFOR's Forestry Department in charge of maintaining the national inventory up-to-date and of providing logistical support to the forest regions in the area of forest mapping and inventory. The unit, created in 1979, has in the past carried out detailed and complex forest inventories. Due to financial constraints the work of this office has lately been very limited.

At present the unit consists of one university level forester, six forest technicians, one cartographer and four draftsmen.

INFONAC will be the COHDEFOR unit responsible for organizing and supporting operation of the timber sale and stumpage appraisal system. This unit will carry out the planning, develop the guidelines and manuals, coordinate the training, provide logistical support and monitor the field work.

b. Regional Forest Offices

COHDEFOR carries out its field operations through nine Forest Regional Offices which, in their jurisdiction, are responsible for applying the forest law, carrying out COHDEFOR's programs and authorizing utilization permits. These offices will be in charge of implementing the timber sale and stumpage appraisal system. To carry out this function, each Forest Region with harvesting operations will have one or more crews of three technicians to carry out the forest inventories needed for making the timber sales and at least one technician in charge of supervising the logging operations.

According to the present rates, the volume of pine saw timber to be harvested annually in each forest district will be less than the following approximation:

Exhibit No. 10

Approximation of Volume of Pine Sawn Timber Per District
(M3/Year)

Francisco Morazân	300,000
Olancho	300,000
Comayagua	100,000
Yoro	100,000
El Paraîso	100,000
Nor Occidental	50,000
Copân	50,000
TOTAL	1,000,000

One crew of three persons can prepare 100,000 cubic meters to sell anually therefore, 10 field crews will be needed for implementing the system and seven technicians will be needed for supervision.

3. Forest Management Units - La Uniôn and Second Forest Management Unit Areas

Each of the nine Forest Regions of COHDEFOR is divided into several Forest Management Units (FMU), the entities which execute almost all of the field work of the Corporation. Under the project, it will be the FMU's in La Uniôn and the second project area that will implement the forest management activities that have been described above.

The FMU in La Uniôn currently has a professional staff totalling 9 individuals -- a Unit Chief, 5 Foresters, 3 Agronomists. This staff will be increased substantially. It is expected that 10 Foresters and 5 agronomists will be added gradually over the life of the project. This professional cadre will be complemented by paraprofessional forest technicians and laborers. To the extent feasible the FMU staff increments will be affected through transfers from the home office in Tegucigalpa.

The project will also support the FMU's through the provision of commodities. These goods will include 4-wheel drive vehicles, sideband radios, walkie-talkies, chain saws and fire supression hand tools.

4. Natural Resource Management Project (NRMP).

The agriculture and grazing improvements to be carried out in La Unión and later in the second FMU, will be implemented through the NRMP. The administrative arrangements are as follows:

The project will provide funds through the MNR for the operations of the agriculture team based in La Unión. This unit will function administratively as a dependency of the MNR regional office in Juticalpa, Olancho, but will depend on the NRMP central office in Tegucigalpa for technical, planning, and logistical support, the same arrangement as used for 24 other Watershed Management Units of the NRMP. It is expected that the NRMP will be continued as an MNR office after the Project PACD in May, 1989. If this is not the case, supervision and support of the field office in La Unión will be transferred to MNR/Juticalpa).

Work plans and annual evaluations for the agriculture team in La Unión will be carried out in collaboration with the COHDEFOR Chief for La Unión (who will have approval rights for each annual work plan), NRMP agriculture field staff (La Unión), NRMP central office staff (Tegucigalpa), and the MNR regional director in Juticalpa. Once the work plan is developed and approved, day to day activities of the field team will be under the direction of the NRMP team's coordinator in La Unión, subject to NRMP central office oversight.

For coordination purposes, the NRMP field team will attend and participate in regular planning meetings with the COHDEFOR and PVO staff based in La Unión. Any disputes that may arise in the implementation of these activities will be considered at the level of regional directors of MNR and COHDEFOR district chiefs.

The Project Budget provides funds for office and field equipment for the NRMP team, as well as vehicles and maintenance. The NRMP field team will be responsible for deployment and control of the vehicles assigned to it.

5. National School of Forest Sciences ESNACIFOR

ESNACIFOR will be the primary administering entity for the in-country training financed by the project. The school will be responsible for planning, organizing, monitoring and evaluating these training activities. It will do the planning in collaboration with the various entities of COHDEFOR, the PIU and AMADEO, and will organize the inputs needed to carry out these plans.

The existing staff of one Ph.D. one M.S.and nine B.S. level instructors will be complemented by consultants, either Honduran or U.S. as appropriate, when outside expertise is required. Efforts will be made to create the capability of ESNACIFOR to continue the presentation of courses supported initially by the outside experts. This will include involving ESNACIFOR instructors in course design, and presentation. In addition, ESNACIFOR staff will participate in a course on adult learning and participatory techniques to increase their teaching effectiveness.

To support ESNACIFOR in the provision of quality training, a full-time local-hire training coordinator will be assigned to the school. Moreover, the capability to produce appropriate training materials will be strengthened through the procurement of commodities.

6. Forest Industry Technical Assistance Unit

A permanent technical assistance unit will be created in COHDEFOR to assist the forest industry. The Unit will function under the Forest Industry Section of the Forest Management Department and will initially consist of one manager and three technicians. Personnel with training in the area of forest industry will be selected to form this unit and their skills will be upgraded through short-term training and complemented with technical assistance.

Technical assistance will be provided to selected forest industries through on-site assistance and training courses. The Unit will also advise in the allocation of the project's credit funds to forest industry.

In the past, COHDEFOR provided modest technical assistance to the industry and the results clearly indicated that significant changes could be implemented through such an approach. This past experience also demonstrated that the Unit can become self-supporting once it has developed prestige and can market its services.

C. Forest Enterprise PVO Contractor

Project funds will be used to finance a direct A.I.D. contract with a qualified PVO to implement the small-scale forest enterprise component. Annual work plans for this activity will be developed by members of the PVO staff in collaboration with the COHDEFOR Chief for La Unión (who has approval rights) and the NRMP team coordinator (La Unión). Day-to-day operations will be organized and supervised by the PVO team leader, subject to the COHDEFOR Chief for La Unión's oversight.

The PVO will be provided with funds for required vehicles and other inputs, and will be responsible for their control. The PVO team leader will participate in regular planning meetings involving the COHDEFOR and NRMP staff.

D. Role and Responsibilities of USAID

The project will be managed by a project officer in the Office of Agricultural and Rural Development of USAID/Honduras. This project officer will be responsible for monitoring the progress of inputs and project activities. He/she will work closely with the Ministry of Natural Resources, COHDEFOR, AMAHDO, ESNACIFOR and other pertinent GOH agencies and the technical assistance team to assure compliance with the terms and conditions of the Project Agreement. The project officer will be assisted by a forestry liason officer, who will be responsible for expediting and guiding activities and communications with the PIU in COHDEFOR.

A Mission Project Committee composed of the project officer, liason forest officer, project support officer and representatives of other Mission offices will review project status on a quarterly basis, identify potential implementation problems, develop solutions and report actions and changes on a quarterly basis, through the Annual Project Implementation Planning (APIP) process.

The Office of Development Finance will be responsible for preparing the Project Agreement as well as Project Implementation Letter No. 1. The Office of the Controller will review all disbursement requests for conformity with A.I.D. regulation and ensure that appropriate accounting practices are followed by the GOH and other participating agencies. The Office of Development Programs will coordinate all evaluations in conjunction with the project officer and will advise on data base requirements for the project.

E. Implementation Period

A seven-year implementation period is proposed for this project. All commodity procurement will be completed and delivered by the sixth year of project implementation. Participation of long-and short-term advisors will be phased over the life of the project to coincide with the implementation of discrete activities.

F. Implementation Plan

Exhibit No. 11 provides a summary of expected project activities to be taken by USAID and the implementing agencies. The activities in this summary will be refined and adjusted during preparation of annual work plans.

G. Procurement Plan

Due to the complexity of the procurement of technical services and commodities, and the lack of experience on the part of the host country entities in procurement, USAID/Honduras will directly procure the services of short-term consultants and the long-term project advisors, as well as the off-shore commodities directly related to project activities.

The Ministry of Natural Resources and COHDEFOR will contract additional personnel, as necessary to implement the project, using A.I.D. host country contracting regulations. COHDEFOR will also be responsible for the procurement of commodities to be procured locally.

Exhibit No. 12 lists all the major procurement actions for the project.

EXHIBIT No. 11

IMPLEMENTATION SCHEDULE AT TIME OF PROJECT APPROVAL
(Illustrative)

LOP: 7 years
PACD: 12/30/94

MAJOR IMPLEMENTATION ACTIONS	PROJECT ACTIVITY	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
START UP				
. Sign Project Agreement	All Activities	AID, MFPC, COHDEFOR	Dec. 1987	
. Issue PIL No. 1	All Activities	AID, DF	Jan. 1988	
. Meet Initial CPs		AIFPC, COHDEFOR	Jan. 1988	Feb. 1988
. PIO/T for US. Forest Service TA	All Activities		Feb. 1988	Feb. 1988
. US Forest Service Contract Negotiated	All Activities		Feb/Mar. 1988	Mar. 1988
. US Forest Service arrives in country			April 1988	LOP
. Procurement of vehicles and forest field crew equipment.	All Activities		Feb. 1988	April 1988
ACTIVITIES INITIATED IN YEAR 1				
. TA develops detailed work plan	All Activities	TA, COHDEFOR	May 1988	July 1988
Evaluation Plan developed	All Activities	TA, COHDEFOR, AID	May 1988	July 1988
Training Plan Prepared		TA/Training Coord./ESNACIFOR	May 1988	July 1988
. Baseline Data collected for purposes of mid-course evaluation; data requirements established by COHDEFOR, TA, AID.	All Activities	COHDEFOR, TA	April 1988	Aug. 1988
. First groups of mid-level COHDEFOR staff selected trained at ESNACIFOR	A, 4.6	Training Coord.	May 1988	Dec. 1988
. First group of persons for degree and non-degree training abroad.	A, C. 1.5, 4.7, 4.8, 10.12	Training Coord./AID	May 1988	Continues through years 5 & 6 of Project

MAJOR IMPLEMENTATION ACTIONS	PROJECT COMPONENT/OUTPUT	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
. Preliminary guidelines for estimating standing timber sale areas prepared, crews trained in forest inventory, COHDEFOR test procedures for timber sales on pilot basis in La Unión.	1.1, 1.2, 1.3	TA and COHDEFOR	April 1988	July 1988
. One week training course on "Clasification of Pine Forests"	1.4	Short term TA/COHDEFOR	May 1988	May 1988
. Export quality control mechanisms and monitoring procedures designed and tested, and COHDEFOR staff training in applying procedures, market analysis & documentation.	2.3, 2.4	Short-term TA team	Sept. 1988	Dec. 1988
. Routing analysis of market prices and trends begins	2.8	COHDEFOR Commercial Dept.	Oct. 1988	LOP
. Estimates of revenue from stumpage and export commission developed, operating budget prepared and analyzed	3.1., 3.2, 3.3, 3.4	COHDEFOR Finance Dept.	Sept. 1988	Oct. 1988 and annually for LOP
. Guidelines and manuals prepared for more efficient operating personnel and accounting procedures, and 21 courses given to train personnel in new operating procedures.	4.1., 4.2, 4.3	TA and COHDEFOR	Dec. 1988	Continues on intermittent basis through LOP
. Develop forest management plan, carry out field work related to plan, pre-				

MAJOR IMPLEMENTATION ACTIONS	PROJECT COMPONENT/OUTPUT	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
sent to community and receive feedback - get plan approved, develop annual work plan and budget - all activities in value grassroots of community.	B, 5.1, 5.7, 9.2[1]	COHDEFOR, Dist. Forest Mgmt. Unit Community (La Unión) TA	Jan. 1988	Dec. 1988
. One week workshop for field staff on strategy and methods of community involvement in forest management and use	B, 9.1	COHDEFOR/TA	May 1988	May 1988
. First set of courses on photo interpretation and social aspects of forest management given.	B, 5 3	Training Coordinator/ESNACIFOR	Oct. 1988	Dec. 1988
. Fire protection crews, look outs and patrols organized and trained; and campaign on fire prevention and control carried out.	B, 6.1, 6.2, 6.3, 6.9 6.10	Fire Protection Specialist	July 1988	Continues through LOP
. Specification for logging under common site conditions developed, and seed trees in timber sale areas marked	B, 8.1, 8.2,	COHDEFOR Forestry Management Unit	Oct. 1988 Dec. 1988	Through LOP
. Contract negotiated with NGO (PVO); NGO begins to provide technical assistance for campesino forest utilization activities and industries, campesino groups organized and strengthened by purposes of forest related activities.	B, 9.3, 9.4, 9.5, 9.6	AID, NGO, COHDEFOR	Jan. 1988	Through LOP

MAJOR IMPLEMENTATION ACTIONS	PROJECT COMPONENT/OUTPUT	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
. Rotating Fund established to provide credit for campesino forest related activities	B, 9.7	AID	Nov. 1988	Feb. 1989
. Extension activities for soil conservation, grazing and agroforestry initiated through the Natural Resources Management Project	B, 10.1, 10.3	Natural Res. Mgmt Pro.	May 1988	Through LOP
. Forest Industries Technical Assistance Unite organized and begins operations.	C, 13.1, 13.3	AID, MFPC, CBH	March 1988	Through LOP
. Agreement for fiduciary system for credit to sawmill industry drafted, negotiated and operational.	C, 13.1, 13.3.	AID, MFPC, CBH, Private Banks, FIDE	March 1988 draft Dec. 1988 begins functioning	Through LOP
. Year end evaluation and annual work plan for 1989 prepared.	All components	TA, COHDEFOR, AID	Dec. 1988	Annually through LOP
. Educational and Public Relations/Participation Campaign initiated	A, 1.8, 2.8	COHDEFOR/TA	July 1988	Continues intermittently LOP

MAJOR IMPLEMENTATION ACTIONS	PROJECT COMPONENT/OUTPUT	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
ACTIONS IN YEAR 2				
. Initiate supervision of logging areas	A, 1.18	COHDEFOR/Forestry Dept.	July 1989	Through LOP
. Initiate monitoring program for quality control, quantity and pricing of lumber and other wood product exports according to procedures under component A, outputs 2.2. & 2.3	A, 2.6	COHDEFOR Commercial Dpt.	Jan. 1989	Through LOP
. Initiate campaing for promoting Honduran lumber in foreing markets	A, 2.7	COHDEFOR Commercial Dpt.	Jan. 1989	Through LOP
. Initiate new operating procedures in COHDEFOR	A, 4.4	COHDEFOR, TA	Jan. 1989	Through LOP
. Second group of mid-level personnel selected for long and short term training at ESNACIFOR; and second group of personnel selected for degree and non-degree training overseas.	A, 4.7, 4.8, A, 5.8	Training Coordinator, AID, TA	Jan. 1989	Dec. 1989
. Initiate construction and repair of fire towers develop two-way radio communications network & construct and maintain fire breaks	A, 6.4, 6.5, 6.6	Fire Protection Specialist	March 1989	May 1989 and on annual basis through LOP
. Hire equip, and train forest extensionists for La Unión	A, 6.7, 6.8	COHDEFOR	Feb. 1989	May 1989 and intermittently through LOP
. Initiate "prescribed burning" program	B, 6.12, 6.13	Fire Protection Specialist	June 1989	Oct. 1989 and annually through LOP

MAJOR IMPLEMENTATION ACTIONS	PROJECT COMPONENT/OUTPUT	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
. Initiate forest pest control program	B, 6.14, 6.15	Fire Protection Specialist	Jan. 1989	Continues intermittently through LOP
. Initiate road and skid trail development and maintenance program	B, 7.1,7.4	COHDEFOR, Foret Mgt. Unit and Eng., TA	Jan. 1989	Through LOP
. Initiate program for inspecting logging operations to insure compliance with logging specifications.	B, 8.3	COHDEFOR, Forest Mgt.	Jan. 1989	Through LOP
. Initiate identification, marking and protection of areas to be regenerated	B, 8.4, 8.5	Forest Mgmt. Unit Protection Spec.	Jan. 1989	Through LOP
. Credit program for campesino forest enterprises operational (procure equipment, establish markets)	B, 9.8, 9.9	Contracted NGO	Jan. 1989	Through LOP
. Initiate establishment of selected campesino forest utilization enterprises, and provide TA/training for operation and maintenance of enterprise.	B, 9.10, 9.11, 9.14	Contracted NGO Forestry Mgmt. Unit	Jan. 1989	Through LOP
. Initiate program of improved agricultural and grazing practices, animal vaccinations, pest control, soil conversation techniques, range management, women's activities, and training for farm community leaders	C, 10.3, 10.6, 10.7, 10.8, 10.9, 10.10	NRMP Technical	Jan. 1989	Through LOP

MAJOR IMPLEMENTATION ACTIONS	PROJECT COMPONENT/OUTPUT	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
. Initiate first series of 10 courses at ESNACIFOR, for forest industry, on harvesting practices	C, 11.6	Forest Industry TA Unit and ESNACIFOR	Jan. 1989	Through year 4 of the Project
. Prepare simple operations manuals sawmillers, and initiate training program (35 courses) for forest industry.	C, 12.4, 12.6	Forest Industry, TA Unit and ESNACIFOR		
ACTIONS INITIATED IN YEAR 3				
. Implement new pricing procedures for standing pine timber nationwide,	A, 1.15, 1.17	Forestry Dept. COHDEFOR	April 1990	Through LOP
. Carry out regeneration assessments and identify areas that need to be planted	B, 8.6, 8.7	Forest Mgmt. Unit, Siviculturist	Jan. 1990	Through LOP
. Carry out feasibility studies for rural secondary forest industries linked to sawmills and initiate commercial activities.			July 1990	Through LOP
. Carry out mid-course evaluation and adjust project design, outputs as necessary	All components	TA, AID,	July 1990	October 1990

MAJOR IMPLEMENTATION ACTIONS	PROJECT COMPONENT/OUTPUT	RESPONSIBLE PARTY	ESTIMATED TIME OF INITIATION	TARGET COMPLETION DATE
ACTIVITIES INITIATED IN YEAR 4				
. Develop mechanisms for Forest Industry TA Unit to become financially self-supporting.	C, 12.10	TA and COHDEFOR	Jan. 1991	Dec. 1992
ACTIVITIES INITIATED IN YEAR 7				
. Carry out project-end evaluation	All components	TA, AID	Dec. 1994	Feb. 1995
. Close out of contracts with LT and ST Technical Assistance	All components	AID		

Exhibit No. 12

PROCUREMENT PLAN

Page 1 - Services

SERVICE	DURATION (MONTHS)	PROBABLE SOURCE	WAIVERS	CONTRACTING MODE/ PROCEDURES	PROCUREMENT/ CONTRACTING RESPONSIBILITY
A. SERVICES					
1. Long-Term TA Team					
Timber Mgt. Advisor/COP	36	000		A.I.D. Direct/PASA The PASA will provide long-term and short-term consultants as needed during the LOP	A.I.D.
Forest Timber Sales Exp.	24				
Public Admin. Specialist	18				
Short-Term Under PASA Contract					
Logging Engineer	6				
Lumber Mfgt. Expert	3				
Computer Software Specialist	3				
Lumber Manufacturing Expert	3			*potential 8(a) firm sub-contract	
Forestry Economist	6				
2. Contracting of PVO for Small Forest Enterprise Assistance	78	000 (941)		A.I.D./Grant	A.I.D.
3. Evaluation and Audits	4	000		A.I.D. direct contract, independent of PASA contract A.I.D. Direct PASA to cover one-half of the cost of the Mission's Natural Resources Advisor	A.I.D.
Export Documentation Consultant	3				
Software Consultant	1				
Lumber Quality Supervision Consultant	3				
Market Analysis Consultant	5				
Mgt. Ard Financial Consultant	12				

COMMODITY	NUMBER OF UNITS	PROBABLE SOURCE	WAIVERS	PROCUREMENT/ CONTRACTING RESPONSIBILITY
B. COMMODITIES				
1. Vehicles				A.I.D.
a. 4WD Regular	52			
b. 4WD Heavy	2	000		
c. 4WD Pick-Ups	27			
d. 2-Ton Truck	1			
e. Motorcycles	14	935	Source/Origin for Japanese	
2. Personal Computer	1			A.I.D.
3. Equipment and Supplies for ESNACIFOR				A.I.D.
4. Aerial Photo Transfer Equipment		000		A.I.D.
5. Office and Drafting Materials				A.I.D.
6. Two-Way Radios	20	000		A.I.D.
7. Power Saws	16	000 (941)		A.I.D.
8. Survey/Draft. Equipment				A.I.D.
9. Forest Tools and Materials				COHDEFOR
10. Hand-tools				COHDEFOR
11. Office Furniture and Supplies				COHDEFOR
12. Equipment/Materials (Output 11 & 12)				A.I.D.

H. Evaluation Plan

1. General

The project will be evaluated by the implementing agencies on an annual basis as part of the Annual Work Planning Exercise. At the end of each year field and central staff of COHDEFOR, Ministry of Natural Resources extensionists, AMAHDO and AID staff will review the year's accomplishments as set out by the Annual Work Plan. During the same exercise objectives, budgets, personnel and supply lists for the upcoming year will be set.

Furthermore, there will be two independent evaluations and two audits of the project; the first evaluation in Year 3 and a final evaluation and audit prior to the PACD. The mid-course evaluation will be done by an independent consultant contracted by A.I.D. Mid-course project design adjustments will be made according to evaluation recommendations.

The two independent evaluations will focus on the project's success in achieving the project purpose and verifiable indicators of the objectives. In addition to project evaluations, the regional environmental officer for LAC, will perform periodic environmental reviews to insure that the recommendations and conditions of the Environmental Assessment are being complied with.

2. Data Requirements

To successfully carry-out the mid-course evaluation a baseline of the conditions found in the field, as well as in COHDEFOR and the private sector will have to be established. Compilation of baseline data for all three project components will be an initial task of the technical assistance team.

The data required for the evaluations are divided into three types:

a. Baseline Data

1) Institutional Reorientation of COHDEFOR

These baseline data will need to be collected at the initiation of project activities.

* COHDEFOR statistics on timber sales against which the impact of the new stumpage system will be evaluated.

* COHDEFOR statistics on export sales to evaluate the impact of the project on the export of lumber.

* COHDEFOR annual financial reports, accounting records and budgets against which to evaluate improvement of financial management situation.

* COHDEFOR manuals on personnel and operations, assessment of initial personnel and operating procedures against which to measure effect of project activities on the functioning of COHDEFOR.

ii) Forest Management of Selected Areas

The data and resourse inventory information gathered for the Forest Management Plan for La Unión will serve as the baseline for the evaluation, against which to measure progress.

iii) Strengthening the Forest Industry

* COHDEFOR statistics on wood products.

* COHDEFOR statistics on sawmill production.

* Accounting of other records kept by the sawmills.

* Sawmill studies carried out by COHDEFOR or by consultants.

* Surveys on logging and milling practices, carried out by the Forest Industries Technical Assistance Unit at the beginning of the project.

* Studies and statistics of commercial lending institutions regarding their history of lending to the sawmill industry.

b) Survey Data

A sample survey format will provide the framework for information required to measure the impact of project activities on the beneficiaries. Listed below, for illustrative purposes, are possible survey topics for the project evaluations.

* Acceptability on the part of loggers and sawmillers of new stumpage valuation and sale system.

* Standardized use of export quality controls regulations for export lumber.

* Survey of COHDEFOR's personnel and operations procedures developed under the project - to verify if new manuals are being used, new accounting system functioning.

* Survey La Unión to identify benefits from Forest Management Program: i.e. forest plan being followed; fewer forest fires; more widespread use of conservation methods; rural residents diversifying into forest related small industry; amount of forest road and skid trails constructed according to specs and conditions of timber sale.

* Field sampling to verify logging is being practiced according to new stumpage system, and conditions and practices introduced through project; to verify that sawmillers are receiving lumber at a more constant rate.

* Reforestation at a rate equal to logging.

* Survey of forest industries which received loans under credit component of project to evaluate the effect of credit access on the industries operations.

c. Project Data

Project data will include financial expenditures, project acquisitions, and outputs (see Logical Framework for Verifiable Indicators of Outputs). Financial data will be obtained from COHDEFOR's accounting department, the Project Implementation Unit and the USAID project officer and controller. Other useful documents which will be made available will include:

* Annual Project Implementation Plans

* Semi-Annual Reports

* P.O. Field Trip Reports

* Project Paper, Agreement

* Project Implementation Letters

* Internal AID Financial Reviews

IV. Program Factors

A. Conformity with Host Country Strategy and Programs

The Forestry Development Project has been designed to reflect the development objectives of the Honduran Government. The National Development Plan for 1987-1990 states that Honduras' key objectives for this planning period are: (i) sustained economic growth; (ii) domestic and external financial equilibrium; (iii) employment generation; (iv) fulfillment of basic human needs; and (v) integrated regional development. This project address all of these objectives as they relate to the forestry sector. Through the assistance provided under this project, USAID will be helping the Government of Honduras (GOH) and the private forestry sector to achieve these objectives.

In the first year and a half of the Azcona administration the GOH has made an intensive reevaluation of forestry sector policies. COHDEFOR has traditionally placed its emphasis on the commercialization of the forest resource and the primary wood industry, leaving its role and responsibility in forest management and conservation largely unattended. However, through the policy dialogue initiated by the United States Presidental Agricultural Commission (USPAC) and continued in the Economic Stabilization Program, the GOH has gained a clearer understanding of the problems in the forestry sector. The Honduran National Development Plan projects over 60 million Lempiras in investments for the forest sector during the 1987-1990 planning period. Emphasis will be placed on financing such areas as forest development and protection, lumber and fuel production, forest management and social forestry.

COHDEFOR's "Policies, Measures and Priority Strategies/Actions" for the period 1986-1990 clearly points to the change in functional priorities moving away from the commercial aspects of forestry and into management and protection.

In this planning document COHDEFOR states that major emphasis will be placed on forest management and integrated forest use in selected priority areas of the country. It further states that COHDEFOR's major strategies for this planning period will be to: integrate the rural population in reforestation and forest protection; assist the rural and private sectors to better utilize the forest resource; and promote diversification of forest related commercial activities.

Further evidence of COHDEFOR's shift in priorities, is the effort it has made in divesting itself of it's commercial subsidiaries. During the past year, the GOH has been in the process of selling the first of COHDEFOR's subsidiaries and is in the process of preparing the other holdings for eventual sale. COHDEFOR also intends to introduce an improved method for valuing standing timber and is taking steps to allow greater private sector participation in the marketing and export of lumber and forest products.

B. Relationship to A.I.D. Policies and USAID/H Strategy

The importance of the forestry sector to the Honduran economy has long been recognized by the USAID. In December 1980, the Mission submitted a Forestry Development PID (522-0172) which envisioned a $20 million investment in institutional strengthening of COHDEFOR, policy reform, forest management, and the promotion of primary and secondary industries. The Mission never submitted a Project Paper when it became obvious that the GOH and COHDEFOR were not ready to tackle critical policy issues. With initiation of high level policy discussions on forestry resulting from the Presidential Agricultural Commission, the GOH and private sector have exhibited a greater willingness to confront the serious problems in the sector. These changes convinced the Mission that appropriate assistance at this time could effectively support both A.I.D. and GOH objectives in the sector.

The proposed project is fully consistent with the USAID/Honduras Action Plan for FY88/89, and supports the specific Mission and LAC objectives of increasing agricultural production by $360 million from 1985 to 1990; promoting $370 million in export earnings from 1985 to 1990 and generating 400,000 person-years of productive employment from 1985 to 1990. This project will assist in attaining these objectives by protecting the environment and natural resources through improved forest management, increasing fore product exports and revenues from exports while at the same time developing new and expanded income and employment generating activities f the rural population in the forestry sector.

The proposed project supports the Central American Initiative (CAI) recommendation on increasing agricultural production and the A.I.D. policies on Food and Agriculture, Private Sector, Institution Building, and Policy Dialogue. First, the project will directly support implementation of critical

policy changes which the USG has encouraged in the policy dialogue begun by the USPAC and continued in the Economic Stabilization Facility. Secondly, it will facilitate transition to a greater private sector role in the use and management of the forest resource. Third, the project will assist in the transfer of modern technologies for use in management and conservation of Honduran forestry resources. And finally, it will assist in the development and strengthening of an economically and socially important Honduran public sector institution (COHDEFOR), as well as reorient this institution to focus on forestry management services.

Furthermore, the Forestry Project responds to Public Law 99-529 (October 1986) that amends the Foreign Assistance Act and authorizes A.I.D. to increase its conservation efforts in protecting tropical forests and biological diversity.

The new environmental amendments to the FAA authorize A.I.D., to inter alias:

1. Give high priority to conservation and sustained management of tropical forests;

2. Engage in dialogues with countries which stress the importance of conserving and managing forest resources for long-term benefits;

3. Support projects which offer employment and income, and develop sustainable alternatives to shifting agriculture;

4. Give emphasis to training, institution building, and research that sustains forest management;

5. Conserve and manage watersheds and rehabilitate deforested lands;

6. Conserve biological diversity; and

7. Coordinate public and private investments in the forest sector.

C. Relevant Experience with Similar Projects

The Mission's project implementation experience in areas related to this Project have been primarily with the Natural Resources Management Project (NRMP) and the Rural Technologies Project (PTR). Although both projects had a slow start-up due to the political/economic environment and to organizational difficulties, they are currently making excellent progress. The NRMP has been very successful in working with campesinos to improve and stabilize agricultural production practices in hillside farming. The reforestation and forest management activity in this project was facilitated by a cooperative agreement between COHDEFOR and the NRMP.

In the case of PTR, a broad range of industrial and agricultural technologies has been promoted using indigenous and foreign PVOs coordinated and administered by the Center for Industrial Development (CDI). Like NRMP, the Rural Technology Project has been particularly effective in promoting improved hillside agricultural practices and the use of post harvest technologies. In

addition, the project has provided technical assistance to initiate, improve and expand many types of small industries.

D. Other Donor Activities

The United Nations--through the Food and Agriculture Organization (FAO)--has been involved in Honduras in forest management and industrialization as well as watershed management for more than a decade. In July 1986, FAO completed a five year project that supported the third phase of the Plan Comayagua. During the life of project, 16,745 hectares of pine plantations were established, 196 hectares of pine forest were planted directly, 512 km. of access roads were rehabilitated, 14 forestry nurseries were established or expanded, and 21 million pine plants were produced. Currently, FAO is supporting an energy/industrial development program for forest communities, which began in July 1986. The objective of this project is to promote integrated development and diversification of economic activities in rural forest areas. The FAO is also providing technical assistance to COHDEFOR in establishing rational planning, execution and evaluation systems, as well as providing training to COHDEFOR technicians and administrators. The Canadian International Development Agency (CIDA) has also provided assistance in forest inventory, forest protection, and institutional support to COHDEFOR. CIDA has indicated five areas of interest for support to COHDEFOR. CIDA and COHDEFOR have recently signed a L31 million agreement for a hardwood forestry development project, which will be initiated in 1988. CIDA fully concurs with the need for the policy changes which the Forestry Development Project hopes to achieve.

The Federal Republic of Germany, through its German Technical Service (GTZ) is providing financing and technical assistance to COHDEFOR in forestry concentrating its efforts in the extension and training needs of the integrated forest management units (AMI's). It should be pointed out that the training in this project was designed so as not to duplicate the training program of the GTZ.

Finally, the Centro Agronômico Tropical de Investigaciôn y Enseñanza (CATIE) is supporting COHDEFOR with a ROCAP financed project to cultivate trees for multiple use, for small farmers and rural industries.

V. Summary Project Analyses

A. Economic Analysis

1. Source of Economic Benefits:

During the first seven years, the project will reduce the forest areas being harvested without reducing the amount of wood produced. This savings of forest areas is possible due to: (a) changes in logging practices that eliminate the current waste in logging operations, and (2) improved efficiency in the operation of sawmills. The new stumpage regulations will encourage a more thorough harvesting of forests, helping to eliminate the present 20 percent waste of lower quality logs left abandoned in the woods.

Better maintenance of equipment and other improved practices will gradually increase the efficiency of sawmills. Thus sawmills will be able to enhance their output-to-input and also profitably process even smaller logs presently rejected. At the same time, the substitution of the more efficient band saws for the circular saws will further improve the efficiency of the forestry industry. An additional economic benefit will be the increase in the yield of second growth forest, due to better forest management.

Other economic benefits not necessarily less important, but more difficult to quantify have not been considered in the analysis: the reduction in soil erosion with far reaching effects on water management and land use, animal grazing in forest areas, and production of resin, firewood, pine seed and other forestry subproducts.

2. Magnitude of Economic Benefits

The project has been assessed applying three different sets of criteria (see Table 1 in Annex C):

(a) Financial Profitability: The financial rate of return, which differs from the economic rate of return because market prices rather than economic prices are used, is 20.8 percent.

(b) Economic Profitability: The economic rate of return (ERR) is 21.9 percent. Thus the project is justified on both economic and financial grounds. The sensitivity analysis confirms the ERR stays over a minimum threshold of investment profitability in some worse case scenerios.

(c) Jackson Plan Objectives: The macro level contribution to various Jackson Plan objectives during different time periods is shown in Table 1, Annex C. The Net Economic Benefit figures confirm that forestry investments in Honduras are profitable in spite of the long gestation period characteristic of this type of project. The analysis also highlights the fact that the project is a long term undertaking, being a net consumer of resources during its first four years. From years five to fourteen it provides a positive but still meager net contribution. Afterwards, net benefits of the project grow rapidly, exceeding L56 million a year from years fifteen to twenty four and L98 million a year afterwards.

The initial drop in net GOH revenue is due both to GOH expenditures in the project and the initial reduction in the harvesting of logs, which brings a reduction in stumpage fee collection. From year fifteen on, the project will contribute to increasingly large financial resources to GOH.

The foreign exchange net contribution will evolve in a similar fashion. It will start with an average of just $1.3 million during the first four years, increasing to $47.9 million the last six years.

The project will also affect the employment of unskilled labor. Initially the project will mean reduced employment opportunities because it will cause fewer hectares of forest to be harvested. In compensation, by being able to sustain sawnwood production, the project will later provide significant additional jobs.

During the first fourteen years, the project generates a modest average increase in GDP. Then the contribution to GDP grows rapidly. This also shows that the bulk of benefits from the project will be experienced after at least twenty years. Thus, future generations will enjoy the benefits made possible by present generation actions.

3. Key Issues: The economic success of the project rests on resolution of several constraints which are described. Three actions which will have the most impact on economic success are:

(a) Installation and acceptance of new stumpage regulations is critical but will surely meet opposition from both sawmill and logging operations. Without the new stumpage regulations, the 20 percent waste of logs in logging would likely continue and sawmills would keep working at current efficient levels. There would be no incentive for a particular producer to improve his logging and milling methods and thus save forests for future harvests. This is a case where the well-being of the producer will increase only if they are all forced to adopt the more efficient practices.

(b) Increased efficiency of the sawmill industry will occur by the substitution of efficient band mills for existing circular mills and by better maintenance and operational practices. However, some managers of sawmills may be reluctant to change. Such behaviour will be encouraged by poor enforcement of the new stumpage regulations.

(c) Improved forest management practices are especially critical for long term success. Even with application of improved utilization methods which should sustain the existing forests for thirty years instead of fifteen years with present practices, the forests will inevitably be depleted after thirty years unless second growth forests start showing the higher and earlier yields due to improved forest management practices. Since this is such a long term undertaking, it may easily be given low priority with defects and shortcomings hard to spot until it is too late.

Exhibit No. 13

HONDURAS: SUMMARY OF PRINCIPAL PROJECT LEVEL AND MACRO LEVEL IMPACT OF THE FORESTRY DEVELOPMENT PROJECT

Micro Level Impacts

Economic Internal Rate of Return (ERR)1/	21.9%
of which:	
ERR of Forest Management Component	10.7%
ERR of Remaining Project Components	27.7%
Financial Rate of Return (FRR)	20.8%

Macro Level Impacts

Calendar Years	1987-1990	1991-2000	2001-2010	2011-2016
Project Years	1-4	5-14	15-24	25-30
	Annual Averages (Thousands of Lempiras and Dollars of 1985)			
Change in Employment (men)	-279	-1,084	3,092	5,270
Change in Fiscal Revenue (L)	-2,078	-5,222	10,675	16,925
Additional Foreign Exchange ($)	1,276	4,506	28,243	47,949
Additional GDP (L)	2,524	9,636	73,918	114,812
Change in Labor Income (L)	-580	-2,255	6,432	10,962
Net Economic Benefits (L)	-8,980	6,770	56,761	98,262

1/ Sensitivity analysis of the ERR;

Base run	21.9%
If 10% waste in logging persists	20.5%
If sawmills achieve only 50% of planned Improvement in Efficiency	15.7%
If final prices of sawnwood fall 20%	19.3%
If with-project costs increase by 10%	12.0%

B. Administrative Analysis Summary

1. COHDEFOR

A description of COHDEFOR, and its organization configuration was presented in Section II.B.4. and need not be repeated here. However, to carry out its role within this Project, COHDEFOR will have to continue implementing the organizational changes it began to make in 1986. The heavily centralized and overly bureaucratic Central Services will have to streamline its functions, delegate certain authorities to the field and reduce personnel during the first years of the project in order for it to become the well managed and operational forest service envisioned in this Project. The institution as a whole has taken several steps to refocus its emphasis away from its commercial enterprise activities thereby enabling it to concentrate its efforts in forest conservation and management, and expanding community involvement in the exploitation and care of the forest resource. COHDEFOR has, during the past year, divested itself of two of its commercial subsidiaries and is in the process of preparing the remaining four enterprises for divestiture. COHDEFOR has also recently changed its commercialization system to allow for greater private sector participation in the selling and exportation of sawn lumber. All these actions point to a change in policy on the part of COHDEFOR management and board of directors. This change in policy and in focus is clearly reflected in the strategies presented in COHDEFOR's 1986-1990 planning strategy, titled: "Policies, Measures, and Priority Stratigies/Actions for the Period 1986-1990".

This Mission believes that COHDEFOR has the institutional capacity to carry out this Project. As discussed in Section IV, Program Factors, COHDEFOR has the experience necessary in collaborating with international donors on large scale forestry programs.

COHDEFOR will appoint a senior forester as Director of the PIU who will serve as the primary COHDEFOR representative to coordinate the various activities of the Project. A training coordinator will be hired by COHDEFOR to plan and implement the complex training program. To successfully implement the project, a modest increase in staffing for the Forest Management Unit in La Unión, will be necessary. To the extent possible, and where job requirements meet individual skills already available in COHDEFOR, this staffing requirement will be met by transfering employees from the central office to other districts to La Unión. Where this is not possible, new personnel will be hired.

2. Honduran Association of Sawmill Operators (AMADHO)

From the perspective of the Forestry Project, the most important private sector entity is the Honduran Association of Sawmill Operators (AMAHDO). Established in 1979, this organization groups some 90 sawmills of many sizes and has been the only effective channel to voice the broader interest of private sawmills operators. It operates under the guidance of a Board of Directors composed of six members, all of whom are sawmill owners. The

current Board was elected on July, 1986 to serve for a one-year term. The entity also has an Executive Director, an Administrative Manager, a Secretary, and an Administrative Assistant.

Presently, the only income source for AMADHO is the dues paid by its members. From each sawmill, AMADHO receives a minimum monthly payment of $50, plus $0.25 per Thousand Board Foot (MBF) for volumes produced above 100,000 MBF. In 1986, these sources of revenue generated an income stream of approximately $42,000. These funds are used to pay administrative cost of the Association's office in Tegucigalpa, and other miscellaneous expenses.

Beginning in January 1986, AMADHO was authorized by law to have a representative in the COHDEFOR Board of Directors, to serve as spokesman of private sawmill owners. In this matter, AMADHO has acquired the capacity to oversee actions taken by the state agency, safeguarding the broader interests of private sawmill operators. Likewise, AMADHO has two seats in the Honduran Council of Private Enterprise (COHEP).

As most private sector organizations in Honduras, AMADHO suffers from the crippling deficiency of a meager stream of revenues from dues paid by sawmill operators, which renders it unable to provide effective services to its members and play a more important role in policy formulation. Specifically, the entity lacks technical staff capable of conducting sustained and serious research on policy alternatives to promote the forest industry, and engage in a constructive policy dialogue with the public sector. Urgent policy matters are generally tackled through the voluntaristic efforts of AMADHO's Board members, or by contracting professional expertise for short periods of time (usually no longer than two months). These deficiencies restrict the scope of AMADHO's actions to the hasty elaboration of position papers or press releases, in reaction to initiatives emanating from the public sector. Accordingly, AMADHO's role is generally reactive rather than creative, and is predominantly focused on critical current issues rather than on the identification and solution of the principal constraints hampering development of the Honduran forest industry.

C. Technical Analysis

The Forestry Development Project builds on a sound technical foundation which has evolved from fifteen years of forest management experience in Honduras. In addition, Honduras can draw on experiences in Mexico and the southern U.S. where pine forest management under similar conditions is well advanced. Because the Government of Honduras has made a large investment in training, the country can now draw on a pool of more than 150 professional and 400 mid-level foresters.

1. Institutional Reorientation of COHDEFOR

Carrying out forest inventories for timber sale purposes is one of the most fundamental tasks of the field forester. Many Honduran foresters are well versed in these techniques. The challenge is of an organizational not a

technical nature. A more serious technical challenge will be the study to determine the residual value of standing timber under various conditions, the results of which are to be used to propose pricing alternatives and a stumpage pricing policy. External technical assistance will be needed and is being provided by the project for this purpose.

During recent years COHDEFOR has decreased its involvement in the export of lumber and has permitted increased participation of the private sector, a tendency which will continue under the project. However, in order for COHDEFOR to exercise some control over the amount and quality of private sector exports it must upgrade the function of its marketing department. It is expected that with the small qualified staff and project assistance proposed, this department will be able to carry out these tasks, which will be more control oriented, more restricted than the wide responsibilities this department has had, but did not fulfill in the past.

COHDEFOR has always developed financial analyses, projections of expected revenues and the corresponding budgets. Therefore, technical ability in this area already exists.

To improve procedural manuals, personnel management, accounting, communications and general operating procedures and up-dating the existing manuals technical assistance will be contracted. As COHDEFOR's gives up its role in marketing and in production, and concentrates on management of the forest resource, its structure and operations will be simplified.

2. Forest Management

Practically all of the forest management techniques proposed for the present project have, to a degree, been applied in some past forest management operation. A technically rigorous and objective method was used to select La Union as the first project target area, with excellent prospects for carrying out the intended management.

COHDEFOR has produced several good pine forest management plans over the years. COHDEFOR's technical staff can draw upon this experience and will only need limited assistance in producing an acceptable management plan.

The techniques of protecting the pine forests against damage by wildfire and grazing are simple and well known in Honduras. There is no doubt at all that investment in protecting the forest has a very high pay-off. Here also, the obstacles are not technical but rather social. Although COHDEFOR has expended considerable effort on forest extension over the years, the results are not evident. One reason for the disappointing impact is probably that the messages have lacked relevant content. Extension under this project must not repeat these mistakes but should emphasize the concrete benefits that local inhabitants can derive from the forest and show them how to do so. Mission and COH experience with delivery of similar extension services via NRMP and PTR will be extremely useful in this regard. Once campesinos are allowed to profit from the forest, they will see to it that it does not burn.

COHDEFOR has already constructed and contracted road construction in many parts of the country. Technically these present no problems. The difficulty that can be foreseen is the control of the road construction by COHDEFOR to ascertain that specifications are adhered to. Consequently, COHDEFOR must create an impartial system of outside inspection.

Successful natural regeneration of the pine forests of Honduras has frequently been demonstrated as long as seed trees are available and the young trees are protected against wildfire and grazing for the first seven to ten years. Leaving marked seed trees is a proven, low cost practice that should present no major difficulties. Artificial regeneration through plantations and direct seeding is forseen only on a modest scale on areas without seed trees. These techniques are well tried but more expensive than natural regeneration and should be used sparingly. However the control of fire and grazing are both serious challenges faced by forestry in the pine forests of Honduras. The project follows an appropriate strategy that attacks the problem on several fronts.

Several of the income generating activities foreseen present few technical difficulties and require no large investments, and for this reason should be initiated first (oxen logging, pit sawing, seed collection, production of railroad ties, resination and wage labor in forest management). However, the more promising and lucrative activities such as charcoal production, the utilization of small dimension trees and especially secondary wood industries are technically more challenging and will require intensive technical assistance from the PVO contractor. The feasibility studies that these enterprises require will have to look carefully at the appropriateness of the technologies, at marketing, at the environmental implications and at the long-term availability of the resource.

The agricultural and grazing techniques and the delivery system proposed for the project are based on those evolved during more than five years of field experience of the Natural Resources Management Project. It is forseen that technical specialists from that project will also be responsible for assisting these activities in the Forest Development Project.

3. Strengthening of Forest Industry

The Forest Industry Technical Assistance Unit can play an important role in speeding up the process by teaching the use of more efficient logging practices, equipment maintenance and residue use -- three areas in which Honduran loggers are particularly deficient. Most of these techniques are used by some progressive operations in Honduras or under similar conditions in other countries.

For reasons of economy the same Forest Industry Technical Assistance Unit will be used to teach the practices that most urgently need improvement in Honduran sawmills: sawmill maintenance, wood drying, lumber handling and mill residue utilization; using an appropriate agressive and mobile approach, taking its services to the forest and the mills and not limiting itself to teaching courses.

4. Conclusions

In summary, although the Forestry Development Project is a complicated project with an unusually wide range of activities, the techniques are well tried and appropriate and should not present serious obstacles. The most likely difficulties will be those of an organizational and social nature.

D. Social Analysis

1. Description of the Target Population

The primary beneficiaries of the project will be the approximately 22,000 rural dwellers residing in the La Unión area as well as those residents living in the second area that will be selected. With rare exceptions, these rural dwellers are small farmers who can be divided into three distinct groups: (1) basic grain growers; (2) coffee producers; and (3) cattlemen.

a. Basic Grain Growers

The majority of the basic grain growers (beans and corn) are peasant farmers who operate individual plots. Farm sizes are extremely small, averaging slightly less than 4 hectares, and the produce is used primarily to satisfy household subsistence needs; only a limited portion of "excess" produce is marketed. The technology employed is rudimentary and yields are extremely low, averaging less than 20 quintals per/hectare for corn and only 6.4 quintals per/hectare for beans. Access to the factors of production (e.g. technical assistance, credit, modern techniques) that would enhance output are extremely limited. These growers are the principal practitioners of the slash and burn farming method, described earlier, which is a prime contributing factor to the loss of forest. The slash and burn farming severely limits the economic return that the growers can realize for their efforts. It also quickly depletes soil fertility obliging the farmer to repeat the cycle and further denude the forest.

Livestock production is a common complementary economic activity for most basic grain producers. While herd sizes are small, (they range betweeen 2-8 animals/farm), the grazing practices employed further contribute to forest degradation. A relatively thick tree canopy does not lend itself to abundant pasture. Consequently, tree cover is burned away to enhance pasture growth -- a process which permanently removes land from forest use.

b. Coffee Growers

It is estimated that there are approximately 250 coffee farmers in the La Unión area. In general, they are relatively recent migrants who have come from the Aguan Valley in search of land. Like the basic grain farmers, the coffee producers tend to operate small holdings (average farm size is between 3-4 hectares) under basically rudimentary conditions. The differences in cultural practices between the coffee growers and their basic grain counterparts are essentially matters of degree not kind. Coffee growers have

slightly improved access to technical assistance and credit through their association with IHCAFE, which has assisted them to apply some measure of advanced production methods. More importantly, by concentrating on a cash commodity, they are more closely tied to the marketplace.

c. Cattlemen

Cattlemen in the project area, while fewer in number than basic grain farmers and coffee growers, tend to occupy larger expanses of land. Available data indicate that there are 20,303 head of cattle in La Unión, representing a grazing density of 12.5 cattle per sq. kilometer or one head per 8 hectares. Cattle farms range in size up to 50 hectares and herd sizes up to 1000 head of cattle.

Clearly the primary purpose of the cattle operations is to produce meat for sale. This, in turn, requires sizeable areas of pasture. The pasture is created by removing the forest canopy and burning of the ground cover to plant pasture grasses. Once the land is tranformed to pasture it is difficult or impossible to return it to forest use.

A portion of the terrain used by the cattlemen is land that has already been cleared, worked and then abandoned by basic grain growers. Hence, the clearing of forest for grazing purposes is not as extensive as it might otherwise be. Nevertheless, if the encroachment of stockmen into forest areas continues, it will precipitate an ever increasing conversion of forest land to pasture.

2. Sociocultural Feasibility

The sociocultural feasibility of the project depends on providing a package of interventions which enlightens local residents as to proper protection and use of the forest. In so doing, the Project will provide them with an economic incentive to use forests resource more efficiently, and places rational limits on the use of forest land for other than timber production purposes.

It is the judgement of the USAID/Honduras Mission, that the project, as designed, addresses these concerns. First, COHDEFOR, as a part of its expanded forest management role will arrange for training and public education campaigns targetted at residents in the project areas, to explain forest protection techniques as well as the benefit to be achieved from properly utilizing the forest resources. The recruitment of residents to serve, on a paid basis, in local forest fire brigades is an example of direct beneficiary participation in forest protection activities.

Second, the Corporation will undertake an extension effort which will provide forest dwellers, especially basic grain farmers, with technical assistance to improve the economic return to be realized from small scale farming. The core of this effort will be the presentation of modern agroforesty methods designed to diversify production, increase yields and conserve the soil. Successful implementation of this program will bring about a shift from slash and burn

agriculture to sedentary farming thereby reversing, over time, the current trend of burning off tree cover. This effort will be complemented by an initiative, implemented by a private organization to promote and finance small scale forest products industry. The organization will carry out the technical and marketing feasibility studies for these industries and will also serve as a conduit for credit to capitalize them. Both the agroforestry and industry activities will be carried out in a collaborative fashion assuring active beneficiary participation.

Finally, while the project will not support an active effort to limit the immigration of people to the target zones, it will undertake a program to restrict use of areas designated as forest reserves. Clear posting of reserve areas, complemented by ground patrols as well as strict enforcement of sanctions for unauthorized woodland clearing will serve to discourage destruction and protect the timber resources.

E. Environmental Analysis

The comprehensive Initial Environment Examination, prepared by the Regional Environmental Management Specialist Officer in April, 1987, recommended approval of a negative determination based on the implementation of conditions and guidance contained in the IEE. The LAC threshold decision, based on recent FAA regulations gave a positive determination requiring the development of an Environmental Assessment. A scoping exercise and further environmental analysis was carried out leading to the preparation of the E.A. in June 1987. The E.A. was approved by the LAC Chief Environmental Officer on August 25, 1987(see cable STATE 264984), along with an authorization for environmental review of the Forest Management of Selected Areas Component after authorization of project financing. This Component will be incrementally funded based upon an A.I.D. review and approval of the FMP.

The project faces two major challenges: (1) to strengthen COHDEFOR so it can regulate and promote the carrying out of environmentally sound forest management operations, and (2) to integrate COHDEFOR's forestry and conservation activities with rural development.

The main environmental problems faced are: (1) the high incidence of uncontrolled forest fires; (2) erosion and downstream watershed impacts due to logging operations roadwork, extensive grazing and shifting agricultural practices; (3) loss of forest cover and biological diversity. Various project inputs and COHDEFOR's and other project actions described in the Project Description will mitigate these problems.

The E.A. includes several recommendations and guidance for environmental planning and mitigation to be included in COHDEFOR's forest management plans. These cover five major subjects:

1. Establish biologic/hydrologic reserves;

2. Practice watershed management to protect community water and supplies;

3. Construct, improve and maintain forest roads and trails in an environmentally sound manner;

4. Carry out environmentally sound logging practices; and

5. Protect biological diversity and secure sustainable production of forest resources.

The three conditions and one covenant proposed in the E.A., are the following:

1. Two biological/hydrological reserves (#1 Montaña La Muralla, Los Higuerales, Las Porras; and #2 Montaña El Armado - Rompeculo and El Boqueron) are to be decreed legally and delineated in the field with boundary markers prior to subsequent disbursement of project funds;

2. The Regional and Bureau environmental officers will carry out an environmental review of the forestry management plan prior to USAID's approval; and obligation of funds for forest management in selected areas; and

3. The project, with assistance from the Regional Environmental Officer, is to prepare an Environmental Assessment for the new management Areas 2 and 3 as they are identified and proposed for inclusion in the project; and

4. COHDEFOR to use its best efforts to insure that private loggers and sawmillers comply with the management practices and recommendations in the E.A. and the forest management plans. (covenant)

The first condition and the covenant have been included in the Project Agreement. Conditions 2 and 3 are actions to be taken by A.I.D. rather than the GOH, and therefore were not included in the Project Agreement. Conditions 2 and 3 were included in the Action Memorandum to the Mission Director to authorize this Project.

ANNEXES TO THE FORESTRY PROJECT
PAPER (522-0246)

Project title and number: FORESTRY DEVELOPMENT PROJECT (522-0246) Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Sector Goal:	Measures of goal achievement:		Assumptions for achieving targets:
To contribute to the value of agricultural production through sustainable levels in production and exports derived from the forest sector.	- A 7% increase in forestry sector wood production by FACD, 1994. - Wood and wood products exports sustained at the present rate of 121 million board feet per year	- National Accounts - COHDEFOR production records - COHDEFOR export records	- Policies for private sector participation in forest product marketings continue. - Continued stability of democratic government.
Project Purpose:	Conditions that will indicate purpose has been achieved: End of project status		Assumptions for achieving purpose.
To improve the management and sustainable productivity of commercial pine forests and the efficiency of industrial conversion and marketing of wood product.	1. COHDEFOR has relinquished all industrial operations. 2. COHDEFOR's financial situation is stabilized with adequate income to cover costs. 3. All timber transaction carried out in accordance with rational forest management plans. 4. Forest utilization carried out in accordance with allowable cut. 5. Industry able to utilize profitably a wider range of timber resources. 6. Sustainability of pine forest management measured by acceptable level of regeneration, environmentally sound logging, forest management practices forest management practices.	1. COHDEFOR records 2. Project monitoring 3. Project evaluations 4. Project audits 5. Consultant reports 6. Periodic environmental reviews	- Continued administrative stability within COHDEFOR. - Continued favorable international prices. - No occurrance of natural disasters in project areas.
A. Institutional reorientation of COHDEFOR			
1. All industrial scale sales of pine timber in Honduras made using stumpage sale and valuation system and logged according to timber sale regulations.	1.a. Trained, equipped crews carrying out inventories for timber sales in all management units in which commercial pine timber is being cut. 1.b. All commercial pine timber sold on stump through sale contracts according to procedures developed by project. 1.c. Environmental procedures, including technical guidelines for road and trail construction/maintenance and logging practices, incorporated in all sale contracts.	1. Field inspections. 2. COHDEFOR timber sale records. 3. Inspection of loggers' records and permits.	1. New stumpage valuation and sale system in use.
2. All lumber export handled and negotiated by private sector with appropriate monetary benefit accruing to national government.	2.a. COHDEFOR no longer handles lumber or other products for export 2.b. COHDEFOR no longer involved in direct negotiations for export of lumber 2.c. All export of lumber carried out according to clear, public and impartial guidelines 2.d. All export of lumber and wood products monitored by COHDEFOR	1. COHDEFOR accounting records 2. Periodic audits by USAID and independent auditors 3. COHDEFOR annual financial reports 4. Customs records	1. Reasonably efficient customs controls.
3. COHDEFOR covering its operational costs and functioning efficiently according to modern, appropriate operating procedures.	3.a. COHDEFOR's operational costs do not exceed revenues derived from stumpage charge and export commissions. 3.b. Management manuals being used to guide operations 3.c. Accounting system functioning according to generally accepted professional standards 3.d. Objectives established for each office and division 3.e. Objective requirements established and reinforced for all positions in COHDEFOR. 3.f. System of performance evaluation based upon objectives, in operation for both institutions and personnel.	1. COHDEFOR accounting records 2. Periodic audits by USAID and independent auditors 3. COHDEFOR annual financial reports 4. Quarterly progress reports 5. COHDEFOR's manuals 6. Project evaluations 7. Project consultant reports	1. Stable domestic and international wood market prices. 2. Reasonable stability of COHDEFOR personnel.

y

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
B. Forest management of selected areas			
4. Forest management plans for la Union, AREA2 and AREA3 completed and operational.	4.a. Planning document meeting standards for intensive pine forest management plans. 4.b. Detailed annual work plan and budget based on management plan, approved by COHDEFOR.	1. Project documents. 2. Technical briefings with COHDEFOR. 3. Project monitoring. 4. COHDEFOR's approved budget.	1. Timely approval of COHDEFOR's budget at required levels of funding.
5. La Union and AREA2 forests protected against damage from wildfire, grazing, land clearing and pests.	5.a. Four fire towers constructed and manned during fire season. 5.b. Less than 2% of the area of regenerating forest is burned annually by wildfires 5.c. All campesino groups that are deriving income from forest, assisting in detection and combat of wildfires. 5.d. Illegal land clearing of managed pine forest eliminated by fourth year under management 5.e. Regular terrestrial and aerial detection of pests under way according to control plan. 5.f. All detected pest outbreaks being combatted by proper control techniques. 5.g. Two wildland areas decreed and protected in La Union 5.h. Watershed management carried out on those watersheds supplying local communities	1. COHDEFOR fire control records and maps. 2. Field inspections and interviews. 3. Aerial photo interpretation. 4. Periodic environmental reviews. 5. Project evaluation with environmental component 6. Water quality monitoring on community watersheds	1. No catastrophic dry season. 2. No catastrophic insect epidemic. 3. Legislation limiting indiscriminate burning of forest enforced. 4. Legislation covering land clearing enforced.
6. Forest road system in La Union and AREA2 expanded and upgraded according to the levels indicated in the forest management plans.	6.a. Secondary forest roads = 63km constructed by loggers according to specifications of timber sale contract 6.b. Skid trails constructed by loggers according to specifications of timber sale contract 6.c. All roads and skid trails constructed so as to minimize watershed impacts 6.d. All primary and secondary roads of the forest properly maintained, with respect to watershed management criteria	1. Field inspections. 2. Forest management maps. 3. Aerial photo interpretation. 4. Periodic environmental reviews 5.	1. Funding can be arranged for Manguelile-Yoro road 2. Timely approval of COHDEFOR budget at required levels of funding.
7. Logged and understocked sites in La Union and AREA2 regenerated according to management plans.	7.a. Detailed, environmentally sound logging requiations, designed to encourage regeneration as well as for other benefits, are part of all timber sales. 7.b. At least 15 seed trees/ha left on all timber sale areas where natural regeneration is prescribed by management plan. 7.c. Of all areas logged 3 years previously and prescribed for natural regeneration, 70% of the area is adequately stocked with at least 80% of sample quadrats occupied by at least one seedling 7.d. Of all sites prescribed for artificial regeneration, 80% of the area is adequately stocked at age 3 years, with at least 80% survival of planted stock or 80% occupancy of seed spots 7.e. Of all understocked areas prescribed for natural regeneration, 3 years after prescription of intensive protection or treatment, 70% of the area is adequately stocked with at least 80% of sample quadrats occupied by at least one seedling 7.f. All logging practices appropriate to site conditions and carried out in an environmentally sound way	1. Forest management records. 2. Fire control maps. 3. Project monitoring. 4. Project evaluations with environmental component. 5. Periodic environmental reviews.	1. No catastrophic dry seasons. 2. Forest industries utilizing the forest in La Union. 3. Legislation limiting indiscriminate burning of forest enforced.
8. Local population in La Union and AREA2 deriving significant and sustained income from forest based industries and activities.	8.a. Twenty campesino groups in La Union and 10 in AREA2 deriving significant income from forest. 8.b. Equivalent of 700 full-time forest based jobs created in La Union and 300 in AREA2 8.c. Viable, campesino operated forest industries based on use of logging residues and of trees too small to extract to sawmill 8.d. Animal logging in use on all timber sales where terrain, log size and availability of animals permits.	1. Forest inventories. 2. Records from campesino industries . 3. COHDEFOR accounting records. 4. Project evaluations. 5. Project monitoring.	1. Local inhabitants disposed to participate in the activity planned. 2. Market can be developed for products produced by campesino industries.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	8.e. All routine road maintainance contracted to local inhabitants whenever their availability permits. 8.f. All silvicultural operations (planting, thinning, etc.) contracted to local inhabitants whenever their availability permits.		
9. Agricultural and grazing practices in La Union and AREA2 improved and harmonized with forest management.	9.a. At least 1200 campesinos producing agricultural commodities on 2400 ha of land improved with soil conservation in La Union by FACD, and half as much in AREA2. 9.b. Of those participating farmers producing less than 4000 lb of corn/mz 75% have had production raised to 5000 lb/mz. 9.c. Of those participating farmers producing less that 1300 lb beans/mz 75% have had production raised to 1600 lb/mz. 9.d. Of those farmers owning less than 20 head cattle, 75% are meeting forage needs during half of the dry season with supplements from improved pasture, rotation grazing, cut-and-carry grasses, etc. 9.e. Income from animal husbandry maintained at current level or increased but with reduction in herd size to one half.	1. Monthly reports of extensionists. 2. Field samples taken during project evaluations. 3. Forest fire reports and maps. 4. National census of animals (Encuesta Ganadera). 5. Project monitoring.	
C. Strengthening of forest industry			
10. Better utilization of standing timber volume through economically sound and technically efficient logging and residue use.	10.a. All trees greater than 14 inches d.b.h. are harvested for sawmills, unless reserved for seed trees or other purposes. 10.b. Trees felled and bucked for maximum utilization according to correct practices outlined in published guidelines. 10.c. All commercial standing volume included in timber sales utilized by Year 3 (in contrast to present practices of leaving 20% wasted) 10.d. Sawmills receiving logs at more constant rate, so that down time caused by lack of logs is reduced to half of present downtime	1. Field sampling as part of stumpage study, other studies and project evaluations. 2. COHDEFOR routine statistics on wood products. 3. COHDEFOR records on control of timber sales. 4. Records of log delivery to sawmills. 5. Record of logs extracted per timber sale. 6. Project monitoring.	1. Viable market available for wood products from residues. 2. Logging cutting permits available in a timely fashion.
11. Greater efficiency of sawmills.	11.a. Sawmills utilizing logs down to minimum top diameter of 6 inches. 11.b. Lumber recovery increased from the present average of 191 bd.ft./m3 to 245 bd.ft./m3 by FACD, for all sawmills assisted 11.c. Thickness of boards within 1/8 inch tolerance, for all sawmills assisted. 11.d. Lumber processed by band sawmills increased from present 60 % to 90 % of all lumber produced by FACD. 11.e. Downtime of primary breakdown saws decreased by 25%, for all sawmills assisted	1. COHDEFOR routine production statistics 2. Routine production statistics maintained by sawmills 3. Existing sawmill studies carried out by COHDEFOR, for baseline situation 4. Field sample studies of selected mills 5. Control procedures for to be implemented by the sawmills receiving financing	1. Loggings cutting permits available in a timely fashion.
12. Financing available to viable primary forest operations and industry for improvements leading to greater efficiency and environmentally sound practises	12.a. At least 30 forest industries have received loans for at least $5 million and have applied them to improve efficiency. 12.b. All credit being allocated according to feasibility studies which include environmental guidelines. 12.c. All credit used according to credit agreement. 12.d. Repayment delinquency less than ... %	1. Accounting records of the lending institutions. 2. Inspection of credit agreements and feasibility studies. 3. Inspection of reports of technicians of lending institutions. 4. Inspection visits to selected creditors. 5. Periodic environmental evaluations	1. Projected demand for credit materializes.

CONDITIONS PRECEDENT AND COVENANTS

A. Conditions Precedent To Initial Disbursement

1. An opinion of the Attorney General of the Republic or of Council acceptable to A.I.D. that the Project Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Borrower/Grantee and that it constitutes a valid and legally binding obligation of the Borrower/Grantee in accordance with all of its terms.

2. A statement of the names of the persons holding or acting in the office of the Borrower/Grantee, and a specimen signature of each person specified in such statement.

B. Conditions Precedent To Subsequent Disbursement

1. The Borrower/Grantee furnishes to A.I.D. evidence that the Project Implementation Unit has been established and staffed including the assignment of a full time Environmental Review Officer; within 120 days of the signing of the Project Agreement.

2. The Borrower/Grantee will furnish to A.I.D. evidence that the Government of Honduras has formulated, and is committed to implement a Forest Management Plan for the La Unión Area, which will be submitted to AID for approval.

3 The Borrower/Grantee will furnish evidence that the Government of Honduras has formulated and is committed to implementing a consistent rational policy concerning the utilization of the pine forest of La Union in particular and the country in general.

4. The Borrower/Grantee will furnish evidence that two biological/hydrological reserves (No. 1: Montaña La Muralla and Los Higueralés, Las Porras; and No. 2: Montaña El Armado-Rompeculo and El Boqueron) have been legally decreed and delimited in the field with boundary markers.

5. The Borrower/Grantee will furnish evidence that a comprehensive personnel management plan has been developed by COHDEFOR and has been approved by its Board of Directors and that the Board of Directors has made a formal motion to make the personnel plan operational by January 31, 1989.

C. Covenants

1. The Borrower/Grantee covenants that the role of the Central Bank of Honduras, in the rediscounting of credit to the sawmill industry, will be only to review the loan application to ensure that the purpose of the loan is adhered to, and that all the documents

necessary for its rediscount are in order, and that the Private Bank will judge the credit worthiness of the application.

2. The Borrower/Grantee will make every effort to ensure that private loggers and sawmillers comply with the management practices and recommendations as stated in the Environmental Assessment and the Forest Management Plan.

3. The Borrower/Grantee will continue to apply, on a nationwide basis, the present lumber marketing system; this will include further enhancement of private sector participation and the continued use of clear and objective eligibility criteria to insure impartiality.

4. The Borrower/Grantee will continue to implement the policy for liquidation, or transfer to the private sector, of COHDEFOR sawmills and lumberyards.

5. The Borrower/Grantee will reaffirm the COHDEFOR commitment not to establish new production activities which compete with private sector endeavors.

6. The Borrower/Grantee covenants to change, on a nation-wide basis, its present sales system to that of selling forest resources according to standing timber volumes by January 1990.

7. The Borrower/Grantee covenants to allow multiyear contracting for project personnel.

8. The Borrower/Grantee convenants to establish an evaluation program as part of the Project. The program will include during the implementation of the Project and at one or more points thereafter: (1) evaluation of progress toward attainment of the objectives of the Project; (2) identification and evaluaion of problem areas or constraints which may inhibit such attainment; (3) assessment of how such inforamtion may be used to help overcome such problems; and (4) evaluation of the overall development impact of the Project.

ANNEX C

UNCLASSIFIED

TE

ACTION: AID INFO: AMB DCM ECON ~~AID~~ CHRON/8

VZCZCTGO250
PP RUEHTG
DE RUEHC #0830/01 0800653
ZNR UUUUU ZGB
P 220639Z MAR 84
FM SECSTATE WASHDC
TO AMEMBASSY TEGUCIGALPA PRIORITY 9173
BT
UNCLAS SECTION 01 OF 02 STATE 080832

DOC: 351 683
22 MAR 84 1714
CN: 17544
CHRG: AID
DIST: AID

AIDAC

EOMO. 12356: N/A
TAGS:
SUBJECT:HONDURAS FORESTRY DEVELOPMENT PID (522-0246) PP GUIDANCE CABLE

1. THE LAC BUREAU REVIEWED AND APPROVED SUBJECT PID ON FEBRUARY 24, 1984. THE MISSION DID AN EXCELLENT JOB OF ADDRESSING A COMPLEX SECTOR.

2. DURING PP DEVELOPMENT, THE MISSION SHOULD CONSIDER THE FOLLOWING CONCERNS.

---- A. POLICY ENVIRONMENT.

---- (1) THE BUREAU SUPPORTS MISSION STRATEGY TO CONDITION POLICY CHANGES PRIOR TO PP SUBMISSION. THE MISSION SHOULD CONTINUE TO FRAME THESE CONDITIONS TO CREATE MAXIMUM LEVERAGE SO THAT THE MOST ECONOMIC BENEFITS CAN BE REALIZED. THE PROJECT SHOULD BE JUSTIFIED IN TERMS OF THE ECONOMIC BENEFITS DERIVED; POLICY CHANGES MUST BE ADEQUATE TO BRING ABOUT THESE BENEFITS.

---- (2) THE PID PLACES MUCH EMPHASIS ON THE COMMERCIAL POLICY ARGUMENTS. THE RATIONALE POINTS TO THE PROFITABILITY THAT INCENTIVES FOR PRIVATE SECTOR INVESTMENT WILL STIMULATE FOREST MANAGEMENT ACTIVITIES AND THAT PROFITABLE OPERATION OF THEIR INVESTMENT BUSINESS WILL IMPROVE FOREST MANAGEMENT PROGRAMS. HOWEVER, WE FEAR INCREASED PRIVATE SECTOR EMPHASIS MIGHT BLUR THE NECESSITY TO CONCENTRATE ON FOREST MANAGEMENT POLICIES AND PROGRAMS. THEREFORE, THE PP SHOULD CLEARLY INDICATE HOW THE PROJECT DESIGN WILL ASSURE THAT THE EMPHASIS ON COMMERCIAL POLICY DOES NOT ACT AS A DETRIMENT TO THE FOREST MANAGEMENT ACTIVITIES INCLUDING THE DELINEATION OF COMMERCIAL VS. PROTECTED FOREST LANDS.

---- (3) THE POLICY ADJUSTMENTS ENVISIONED SHOULD HELP IN PROVIDING INCENTIVES FOR THE PRIVATE SECTOR TO ENTER EXPORT MARKETING. NEVERTHELESS, THERE WILL MOST LIKELY EXIST CONSIDERABLE PRESSURE AND STRONG INSTITUTIONAL PRESSURE FOR CONDECOR TO CONTINUE SIMPLE PROFITS THROUGH EXPORT MARKETING. IN THE PP

ACTION Dist
No.
INFO OFFICES
D
FMD
PLA
MGT
FOR
PDMT
CEN
HRD
ENGR
ENVR
ENER
ENR/RNR
ADM
IDB
PHO
C
C
C
C

95

DESIGN, THE MISSION SHOULD INCLUDE A DISCUSSION OF THE GOALS FOR PRIVATE SECTOR MARKETING INVOLVEMENT, AND ESTABLISH A SYSTEM TO MONITOR THE PROGRESS IN ACHIEVING THESE GOALS. THIS SHOULD ENABLE THE MISSION TO ASSURE COHEDFOR COMPLIANCE WITH AGREED UPON POLICY COMMITMENTS DURING PROJECT IMPLEMENTATION.

---- (4) THROUGH THE POLICY DIALOGUE, THE MISSION, PRIVATE SECTOR REPRESENTATIVES AND THE GOF WILL AGREE ON A MARKETING PLAN TO PROVIDE FOR GREATER PRIVATE SECTOR PARTICIPATION IN EXPORT MARKETING. THIS INCLUDES THE LONG TERM GOAL OF HAVING THE PRIVATE SECTOR ASSUME RESPONSIBILITY FOR ALL MARKETING. THE PP SHOULD CONTAIN A FULL DISCUSSION OF THE ADEQUACY OF THE PLAN TO ASSURE PRIVATE SECTOR PARTICIPATION. THE BUREAU FULLY CONCURS WITH THE POSITION THAT ACCEPTANCE OF THE PLAN BY ALL PARTIES SHOULD BE A CP FOR THE SUBMISSION OF THE PP.

B. CREDIT.

---- UNDER THE PROJECT, LENDING INSTITUTIONS WILL MAKE AVAILABLE UP TO DOLS 5 MILLION IN AID FINANCED CREDIT FOR PRIVATE FIRMS. THE MISSION IS REQUESTED TO UNDERTAKE DEMAND ANALYSES FOR THESE LOANS TO DETERMINE THE APPROPRIATE LEVEL OF AID FINANCING. POTENTIAL INTEREST RATES SHOULD BE ANALYZED TO ASSESS THE IMPLICATIONS ON EMPLOYMENT AND FIRM VIABILITY. AGENCY POLICY IS TO USE PRIVATE SECTOR MECHANISMS AS OPPOSED TO

PARASTATAL OR GOVERNMENT OWNED FINANCE INSTITUTIONS. THUS, A PRIVATE SECTOR INSTITUTION SHOULD BE USED. IN EXAMINING ALL ALTERNATIVES, FIRMS SHOULD BE GIVEN CAREFUL CONSIDERATION.

C. INSTITUTIONAL DEVELOPMENT.

--THE PROJECT ENVISIONS SEVERAL POLICY CHANGES, DIFFERENT AND COMPLEX RESPONSIBILITIES, AND STAFF TRAINING WHICH WILL AFFECT THE INSTITUTIONAL MAKE-UP OF COHEDFOR. DURING PP DESIGN, THE MISSION SHOULD UNDERTAKE AN ANALYSIS OF COHEDFOR'S ADMINISTRATIVE STRUCTURE TO DETERMINE WHETHER MODIFICATIONS ARE NECESSARY TO ASSURE IMPLEMENTATION OF POLICIES AND SPECIFIC PROGRAMS. THESE MODIFICATIONS SHOULD ADEQUATELY TAKE INTO ACCOUNT : (1) THE CHANGED EXTERNAL ENVIRONMENT RESULTING FROM INCREASED PRIVATE-PUBLIC SECTOR COOPERATION; AND (2) NEW REQUIREMENTS FOR INTERNAL INSTITUTIONAL CHANGE THROUGH EFFORTS TO ACHIEVE A SMALLER ROLE FOR COHEDFOR IN EXPORT MARKETING, GREATER RELIANCE ON STUMPAGE VALUATION REVENUES AND THE CONCERTED EFFORT TO STRENGTHEN FOREST MANAGEMENT PROGRAMS. A DETAILED ADMINISTRATIVE PLAN AND OPERATIONAL STRATEGY AGREED TO BY COHEDFOR SHOULD BE

BT
#2630

NNNN

INCLUDED IN THE PP.

D. CORFINO.

ASSESS THE SHORT AND LONG TERM IMPACT OF MAINTAINING THE CORFINO INVESTMENTCON CORFINO'S FINANCIAL VIABILITY. CONTINGENT ON THE OUTCOME OF THIS ACTIVITY, THE PP SHOULD DISCUSS RECOMMENDATIONS AND STRATEGIES FOR ALLEVIATING CORFINO OF THIS BURDEN THROUGH SUCH OPTIONS AS DIVESTITURE, TRANSFERRAL TO ANOTHER AGENCY, PRIVATE SECTOR MANAGEMENT OR ESTABLISHING PROFIT AS THE CRITERION FOR SUCCESS, ETC. THE PP SHOULD DISCUSS THE GOH'S WILLINGNESS TO AGREE TO A PARTICULAR OPTION.

E. STUMPAGE VALUATION.

--DURING PP DESIGN, THE MISSION WILL CONTRACT EXPERTS TO DEVELOP THE STUMPAGE VALUATION SYSTEM AND RECOMMEND TRAINING IN UTILIZING THIS SYSTEM FOR PRIVATE SECTOR AND CORFINO EMPLOYEES. THE PP SHOULD DISCUSS ALTERNATIVE VALUATION PLANS, AND THE SELECTED METHOD.

F. ENVIRONMENTAL ASSESSMENT.
F. ENVIRONMENTAL ASSESSMENT.

--AN ENVIRONMENTAL ASSESSMENT WILL BE REQUIRED. IT WILL EXAMINE THE FOLLOWING ISSUES: (1) FAR REGULATION 216.3 (E)(1)(I), A COST-BENEFIT ANALYSIS ON THE SELECTION OF PESTICIDES; (2) POTENTIAL IMPACT OF FOREST ROAD CONSTRUCTION AND RECOMMENDED MITIGATIVE MEASURES; AND (3) GUIDELINES FOR INSURING THAT COMMERCIAL CUTTING ACTIVITIES DO NOT NEGATIVELY IMPACT ON ENDANGERED SPECIES OR THEIR HABITATS. THE MISSION SHOULD SEEK OUTSIDE ASSISTANCE TO UNDERTAKE THESE ACTIVITIES. THE BUREAU WILL HELP THE MISSION IDENTIFY THE APPROPRIATE TECHNICAL ASSISTANCE.

G. IMPLEMENTATION SCHEDULE.

--TO PROGRAM MORE ACCURATELY THE COMPLEX COMPONENTS OF THIS PROJECT, THE MISSION SHOULD ESTABLISH AN IMPLEMENTATION SCHEDULE INDICATING HOW EACH ACTIVITY INTERRELATES. TO THE EXTENT POSSIBLE THE PROJECT SHOULD BE DESIGNED SO AS TO LIMIT THE NEED FOR EXTENSIVE COORDINATION.

H. EARLY ALERT SYSTEM.

--PERTINENT TO THE GRAY AMENDMENT I AND STATE CABLES, THE PP SHOULD CONTAIN A PROCUREMENT PLAN WHICH DESCRIBES THE TYPES OF CONTRACTS AND TYPES OF ORGANIZATIONS TO WHOM CONTRACTS WILL BE AWARDED. SPECIAL EMPHASIS SHOULD BE GIVEN, WHERE APPROPRIATE, TO SMALL, MINORITY OR WOMEN OWNED FIRMS, BLACK COLLEGES AND UNIVERSITIES, AND PVOS CONTROLLED BY BLACK AMERICANS, HISPANIC AMERICANS, WOMEN OR THOSE WHO ARE OTHERWISE ECONOMICALLY AND SOCIALLY DISADVANTAGED. SHOLTZ
ET

10

ANNEX D

SECRETARIA DE HACIENDA Y CREDITO PUBLICO

09-54

REPUBLICA DE HONDURAS

Tegucigalpa. D. C.. 3 de septiembre de 1987 Nº. CP-SF-051..

RECEIVED
US AID/HONDURAS
3 SEP 1987 12 32
C&R UNIT

OFFICE	ACTION	INFO
MD		/
DAD		/
M/T		/
M/[illegible]		
M/C[illegible]		
M/[illegible]		
D[illegible]		/
DF		
[illegible]		/
RD		/
HRD		
HRD/[illegible]		
HRD/[illegible]		
HRD/P		
HRD/[illegible]		
FSP		
EPA		
E[illegible]		
PIG		
[illegible]		
CP ON		/
READ[illegible]		/
OTHER		
C&R		
DUE DA[illegible] 9/17		
ACTION T[illegible] NAME		
ATTACHM. [illegible] YES NO		
INITIALS		

Señor
JOHN SANBRAILO
Director Agencia para el
Desarrollo Internacional (AID)
Presente.

Señor Director:

La Secretaría de Hacienda y Crédito Público en representación del Gobierno de Honduras y en atención a solicitud presentada por la Secretaría de Recursos Naturales, formalmente solicita a la Agencia para el Desarrollo Internacional (AID) conceda financiamiento por un monto de US$12.000,000.00 en calidad de préstamo y US$8.000,000. en concepto de donación para llevar a cabo la ejecución de un Proyecto de Desarrollo Forestal que contribuirá a mejorar el manejo y la productividad sostenida de los bosques de pino de Honduras y la eficiencia de la conversión industrial y el mercado de los productos forestales.

El proyecto denominado "Proyecto de Desarrollo Forestal", ha sido formulado por la Corporación Hondureña de Desarrollo Forestal (COHDEFOR) y atenderá el problema de la rápida destrucción de los bosques. El proyecto consta de tres componentes íntegramente relacionados: 1) Reorientación institucional de COHDEFOR. 2) Manejo Forestal Integrado y 3) Reforzamiento del sector industrial forestal privado.

Asimismo, el proyecto en referencia coincide con las políticas definidas por el presente Gobierno y constituirá el principal apoyo para la implementación de las prioridades y medidas aprobadas por el Consejo Directivo de COHDEFOR en el sentido de mejorar el manejo del recurso forestal para beneficiar el país en general y el sector rural en particular.

En espera de una solución favorable a la presente solicitud, aprovecho la oportunidad para patentizar al Señor Director las muestras

...2/

OFFICIAL FILE COPY

98

SECRETARIA DE HACIENDA Y CREDITO PUBLICO

REPUBLICA DE HONDURAS

Tegucigalpa, D. C.. Nº.....CP-SF-051

...2/

de mi consideración y estima.

Atentamente,

FELIPE BU GIRON
Ministro

cc.: Ing. Rodrigo Castillo Aguilar
Ministro de Recursos Naturales

CFC/GDC/dr.

ANNEX E

Certification Pursuant To Section 611(e) Of The
Foreign Assistance Act of 1961, As Amended

I, John A. Sanbrailo, the principal officer of the Agency for International Development in Honduras, do hereby certify that adequate technical and financial analysis for this Project, Forestry Development, were carried out and that the cost estimates for all activities under this Project are reasonably firm.

John A. Sanbrailo
Mission Director
USAID/Honduras

ANNEX E

Certification Pursuant To Section 611(e) Of The
Foreign Assistance Act of 1961, As Amended

I, John A. Sanbrailo, the principal officer of the Agency for International Development in Honduras, having taken into account among other factors the maintenance and utilization of projects in Honduras previously financed or assisted by the United States, do hereby certify that in my judgement Honduras has both the financial capability and human resources capability to effectively maintain and utilize the capital assistance project: Forestry Development.

John A. Sanbrailo
Mission Director
USAID/Honduras

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable [illegible]: (A) FAA funds generally; (B)(1) Development Assistance funds only; or (B)(2) the Economic Support Fund only.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FY 1987 Continuing Resolution Sec. 526. Has the President certified to the Congress that the government of the recipient country is failing to take adequate measures to prevent narcotic drugs or other controlled substances which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents or from entering the United States unlawfully? — No

2. FAA Sec. 481(h). (This provision applies to assistance of any kind provided by grant, sale, loan, lease, credit, guaranty, or insurance, except assistance from the Child Survival Fund or relating to international narcotics control, disaster and refugee relief, or the provision of food or medicine.) If the recipient is a "major illicit drug producing country" (defined as a country producing during a fiscal year at least five metric tons of opium or 500 metric tons of coca or marijuana) or a "major drug-transit country" (defined as a country that is a significant direct source of illicit drugs significantly affecting the United States, through which such drugs are transported, or through which significant sums of drug-related profits are laundered with the knowledge or complicity of the government, and the President in the March 1 International Narcotics Control Strategy Report (INSCR) determined and certified to the Congress (without — N/A

Congressional enactment, within 30 days of continuous session, of a resolution disapproving such a certification), or has the President determined and certified to the Congress on any other date (with enactment by Congress of a resolution approving such certification), that (a) during the previous year the country has cooperated fully with the United States or taken adequate steps on its own to prevent illicit drugs produced or processed in or transported through such country from being transported into the United States, and to prevent and punish drug profit laundering in the country, or that (b) the vital national interests of the United States require the provision of such assistance?

3. Drug Act Sec. 2013. (This section applies to the same categories of assistance subject to the restrictions in FAA Sec. 481(h), above.) If recipient country is a "major illicit drug producing country" or "major drug-transit country" (as defined for the purpose of FAA Sec 481(h)), has the President submitted a report to Congress listing such country as one (a) which, as a matter of government policy, encourages or facilitates the production or distribution of illicit drugs; (b) in which any senior official of the government engages in, encourages, or facilitates the production or distribution of illegal drugs; (c) in which any member of a U.S. Government agency has suffered or been threatened with violence inflicted by or with the complicity of any government officer; or (d) which fails to provide reasonable cooperation to lawful activities of U.S. drug enforcement agents, unless the President has provided the required certification to Congress pertaining to foreign policy and the drug control and criminal prosecution efforts of that country?

N/A

103

4. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? — No

5. FAA Sec. 620(e)(1). If assistance is to a government, has it (including any government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? — No

6. FAA Secs. 620(a), 620(f), 620D; FY 1987 Continuing Resolution Secs. 512, 560. Is recipient country a Communist country? If so, has the President determined that assistance to the country is important to the national interests of the United States? Will assistance be provided to Angola, Cambodia, Cuba, Iraq, Syria, Vietnam, Libya, or South Yemen? Will assistance be provided to Afghanistan without a certification? — No

7. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, damage or destruction by mob action of U.S. property? — No

8. FAA Sec. 620(l). Has the country failed to enter into an investment guaranty agreement with OPIC? — No

9. FAA Sec. 620(o); Fisherman's Protective Act of 1967 (as amended) Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel because of fishing activity in international waters? (b) Has any deduction required by the Fisherman's Protective Act been made? — No

184

10. FAA Sec. 620(q); FY 1987 Continuing Resolution Sec. 518. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any loan to the country under the FAA? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the FY 1987 Continuing Resolution appropriates funds? — No

11. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percent of the country's budget and amount of the country's foreign exchange or other resources spent on military equipment? (Reference may be made to the annual "Taking Into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.) — Yes

12. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have relations been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? — N/A

13. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operating Year Budget? (Reference may be made to the Taking Into Consideration memo.) — N/A

14. FAA Sec. 620A. Has the President determined that the recipient country grants sanctuary from prosecution to any individual or group which has committed an act of international terrorism or otherwise supports international terrorism? — No

105

15. ISDCA of 1985 Sec. 552(b). Has the Secretary of State determined that the country is a high terrorist threat country after the Secretary of Transportation has determined, pursuant to section 1115(e)(2) of the Federal Aviation Act of 1958, that an airport in the country does not maintain and administer effective security measures? No

16. FAA Sec. 666(b). Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? No

17. FAA Secs. 669, 670. Has the country, after August 3, 1977, delivered to any other country or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards, and without special certification by the President? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) No

18. FAA Sec. 670. If the country is a non-nuclear weapon state, has it, on or after August 8, 1985, exported (or attempted to export) illegally from the United States any material, equipment, or technology which would contribute significantly to the ability of a country to manufacture a nuclear explosive device? No

19. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. on Sept. 25 and 26, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.) No

20. FY 1987 Continuing Resolution Sec. 528. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States? — No

21. FY 1987 Continuing Resolution Sec. 513. Has the duly elected Head of Government of the country been deposed by military coup or decree? — No

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? — No

2. Economic Support Fund Country Criteria

FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the President found that the country made such significant improvement in its human rights record that furnishing such assistance is in the U.S. national interest? — No

107

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes criteria applicable to all projects. Part B applies to projects funded from specific sources only: B(1) applies to all projects funded with Development Assistance; B(2) applies to projects funded from Development Assistance loans; and B(3) applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1987 Continuing Resolution Sec. 523; FAA Sec. 634A. Describe how authorization and appropriations committees of Senate and House have been or will be notified concerning the project.

   Congressional Notification expired without objection in June 1987

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

   Yes

3. FAA Sec. 611(a)(2). If legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

   N/A

4. FY Sec. [illegible] of 1987 Continuing Resolution Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.)

   N/A

108

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	Yes
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	No
7. FAA Sec. 601(a). Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	Project will promote increased private sector participation in wood processing and lumber marketing.
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	It is possible that a U.S. based Private Voluntary Organization will provide technical assistance in the formation of cottage industries to project beneficiaries.
9. FAA Secs. 612(b), 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.	The host country is contributing approximately 37 percent of total project costs.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?	No

109

11. FY 1987 Continuing Resolution Sec. 5[illegible]. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? — No

12. FY 1987 Continuing Resolution Sec. 558 (as interpreted by conference report). If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities (a) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (b) in support of research that is intended primarily to benefit U.S. producers? — No

13. FY 1987 Continuing Resolution Sec. 559. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for the manufacture for export to the U.S. or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel? — N/A

14. FAA Sec. 118(c). Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (a) stress the importance of conserving and sustainably managing forest resources; (b) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (c) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (d) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (e) help conserve forests which have not yet been degraded, by helping to increase production on lands already cleared or degraded; (f) conserve forested watersheds and rehabilitate those which have been deforested; (g) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (h) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (i) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (j) seek to increase the awareness of

Yes

U.S. government agencies and other donors of the immediate and long-term value of tropical forests; and (k) utilize the resources and abilities of all relevant U.S. government agencies?

15. FAA Sec. 119(g)(4)-(6). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas? — Yes

16. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate sysem for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)? — N/A

17. FY 1987 Continuing Resolution Sec. 532. Is disbursement of the assistance conditioned solely on the basis of the policies of any multilateral institution? — No

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Secs. 102(b), 111, 113, 281(a). Describe extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increase labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and

Rural poor in target areas will benefit from technical assistance to improve agricultural technology and properly utilize the forest resources. They will also benefit from technical assistance and credit to establish wood product cottage industries.

insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.

b. FAA Secs. 103, 103A, 104, 105, 106, 120-21. Does the project fit the criteria for the source of funds (functional account) being used? — Yes

c. FAA Sec. 107. Is emphasis placed on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? — Yes

d. FAA Secs. 110, 124(d). Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to whch the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)? — Yes

e. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been reviewed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority? — Yes

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.	The project direct supports the Government of Honduras 5-year development plan.
g. FY 1987 Continuing Resolution Sec. 540. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions?	No
Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilizations?	No
Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?	No
h. FY 1987 Continuing Resolution. Is the assistance being made available to any organization or program which has been determined to support or participate in the management of a program of coercive abortion or involuntary sterilization?	No
If assistance is from the population functional account, are any of the funds to be made available to voluntary family planning projects which do not offer, either directly or through referral to or information about access to, a broad range of family planning methods and services?	N/A
[illegible] Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes

j.	FY 1987 Continuing Resolution. How much of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)?	Minimal amount
k.	FAA Sec. 118(c)(13). If the assistance will support a program or project significantly affecting tropical forests (including projects involving the planting of exotic plant species), will the program or project (a) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and (b) take full account of the environmental impacts of the proposed activities on biological diversity?	Yes
l.	FAA Sec. 118(c)(14). Will assistance be used for (a) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (b) actions which significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas?	No
m.	FAA Sec. 118(c)(15). Will assistance be used for (a) activities which would result in the conversion of forest lands to the rearing of livestock; (b) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands; (c) the colonization of forest lands; or (d) the construction of dams or other water	No

15

control structures which flood relatively undegraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development?

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan at a reasonable rate of interest.

The loan terms will be 40 years at 3 percent. There will be a 10 year grace period during which time a 2% interest rate will apply. Honduras can meet these terms.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest?

N/A

c. FY 1987 Continuing Resolution. If for a loan to a private sector institution from funds made available to carry out the provisions of FAA Sections 103 through 106, will loan be provided, to the maximum extent practicable, at or near the prevailing interest rate paid on Treasury obligations of similar maturity at the time of obligating such funds?

N/A

d. FAA Sec. 122(b). Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities?

Yes

116

3. Economic Support Fund Project Criteria

a.	FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA?	Yes
b.	FAA Sec. 531(e). Will this assistance be used for military or paramilitary purposes?	No
c.	ISDCA of 1985 Sec. 207. Will ESF funds be used to finance the construction, operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such country is a party to the Treaty on the Non-Proliferation of Nuclear Weapons or the Treaty for the Prohibition of Nuclear Weapons in Latin America (the "Treaty of Tlatelolco"), cooperates fully with the IAEA, and pursues nonproliferation policies consistent with those of the United States?	No
d.	FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?	N/A

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. PROCUREMENT

1. FAA Sec. 602(a). Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? — Yes

2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him? — Yes

3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? — N/A

4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) — N/A

5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those — N/A

countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.)

6. FAA Sec. 603. Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates? — No

7. FAA Sec. 621(a). If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? Will the facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? — Yes

8. International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? — Yes

9. FY 1987 Continuing Resolution Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? — Yes

10. FY 1987 Continuing Resolution Sec. 524. If assistance is for consulting service through procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)? — Yes

B. CONSTRUCTION

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used?	No local construction companies will be used. No construction contract will exceed $500,000.
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	Yes
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP), or does assistance have the express approval of Congress?	N/A

C. OTHER RESTRICTIONS

1. FAA Sec. 122(b). If development loan repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter?	Yes
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?	N/A
3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aims or objectives of activities of the Communist-bloc countries?	Yes

4. Will arrangements preclude use of financing:

a. FAA Sec. 104(f); FY 1987 Continuing Resolution Secs. 525, 540. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; or (4) to lobby for abortion? — Yes

b. FAA Sec. 483. To make reimburse-bursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? — Yes

c. FAA Sec. 620(g). To compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President? — Yes

d. FAA Sec. 660. To provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? — Yes

e. FAA Sec. 662. For CIA activities? — Yes

f. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained. — Yes

g. FY 1987 Continuing Resolution Sec. [illegible] to pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel? — Yes

131

h. FY 1987 Continuing Resolution Sec. 505. To pay U.N. assessments, arrearages or dues? — Yes

i. FY 1987 Continuing Resolution Sec. 506. To carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)? — Yes

j. FY 1987 Continuing Resolution Sec. 510. To finance the export of nuclear equipment, fuel, or technology? — Yes

k. FY 1987 Continuing Resolution Sec. 511. For the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? — Yes

l. FY 1986 Continuing Resolution Sec. 516. To be used for publicity or propaganda purposes within U.S. not authorized by Congress? — Yes

122

ANNEX G

ECONOMIC ANALYSIS

1. General description

The project will address a wide array of problems that restrict both the current and future potential production of the Forestry Sector in Honduras. Briefly, the project consists of the following components:

1.1 Financial and Managerial Strengthening of COHDEFOR. In order to enhance COHDEFOR's capacity to carry out functions that are necessary for the successful implementation of the project, three interventions are required:

a) Stumpage Valuation System. The current stumpage system induces the producers to abandon the less valuable but still usable logs, by charging a stumpage rate per cubic meter of logs taken out to the mills. The proposed stumpage system will charge a flat rate per hectare of forest, depending on the total usable wood contained in each forest area.

b) Marketing of Exports. According to the "Winrock International" report on Sawnwood Marketing (1), marketing of Honduras' sawnwood exports suffers from serious deficiencies. The volume of pine sawnwood exports has declined from 192.8 MMBF in 1975 to 92.9 MMBF in 1986 "due primarily to disincentives to production and marketing - not to a shortage of timber or a lack of export markets"(1).

---

(1) A New Strategy for Marketing The Sawnwood of Honduras. Winrock International. July 20, 1984. USAID - Honduras.

Furthermore, during the last ten years FOB prices for Honduras' pine sawnwood have consistently been more than 20% below the price of its chief competitor in world markets, Southern Yellow Pine (SYP) from the Southern USA. Apparently, "much of this price differential is due to prevailing marketing practices"(1).

c) COHDEFOR Management, and Divestiture Assistance. In order to carry out successfully the two above interventions. COHDEFOR will have to improve its management and leave to the private sector the role of sawnwood exporter. Furthermore, in order to enhance its efficiency, COHDEFOR will have to divest itself from some production activities unrelated to the essential services the company must provide to the forestry sector.

1.2 Forest Management of Selected Areas. Under present forest practices, after logs have been taken out from an area, reforestation is careless. Fires, grazing, lack of prunning and of partial cuts, and deficient reproduction itself, severily limit the yields of second-growth forests.

The project will support improved management of the area "La Unión", and of a second area of similar size. These two experiences will serve as pilot cases for COHDEFOR to extend the same practices to all forest areas of the country.

1.3 Strengthening Forest Industry. Both, increased efficiency in all sawmills, and the spread of improved quality bandmills, in sustitution to the less efficient circular

(1) A New Strategy for Marketing The Sawnwood of Honduras. Winrock International. July 20, 1984. USAID - Honduras.

mills, will be an important factor in (a) allowing the processing of some logs presently not feasible to use, (b) reducing the volume of logs required to obtain a given quantity of sawnwood, and (c) improving the quality of the sawnwood.

2. Forest Utilization

2.1 Without Project. The projection of commercial pine forest utilization without project is presented in Table 1. It has been assumed that current levels of productivity in sawmills are maintained, at an average value of 191 board feet of lumber per cubic meter of logs. Year one of the project corresponds to 1987.

The volume of lumber production slightly increases until year 10. By year 15 the depletion of forests forces production levels to decrease rapidly, until by year 23 a depleted sustainable yield is attained, at 33 MMBF per year.

Broom sticks represent 7% of lumber production, and are all exported. Domestic consumption stabilizes by year 10 and is kept constant at 86 MMBF/year. Exports are constant until year 15 when the exaustation of forests forces exports to decrease, and by year 19 Honduras becomes a net importer of lumber to cover its domestic requirements. Although a small volume of broom sticks is always exported, sawnwood imports are much larger, resulting in negative values for net exports.

With respect to logging, due to the prevalence of inefficient practices only 80% of usable logs from lumbered forests are delivered to sawmills. The remaining 20% of logs are abandoned in the field and represent harvest losses.

2.2 With Project. Table 2 presents the projection of commercial pine forest utilization with project in Honduras. Lumber production, consumption and exports, are identical to those without project for the first 15 years, but using significantly smaller quantities of logs. Afterwards, while the exaustation of forests forces total lumber production to decrease in the Without Project scenario, with project high levels are shown to be sustainable along the entire 30 year horizon. Lumber production levels with project become sustainable thanks to:

a) the increase in efficiency in the production of sawmills from 191 BF/m3 on year one, to 254 BF/m3 after year ten. This increased efficiency is brought by better practices in all sawmills, and by the sustitution of the least efficient circular mills by improved bandmills;

b) the implementation of better logging practices, which rapidly eliminate most harvest losses.

With these two technological improvements, by year eleven, total lumber production can be sustained using only 60% of

forest land as compared to the without project situation. "Total used logs" are proportional to lumbered forest areas.

After year 30, initially partial cuts and later final harvest of logs from second growth forest areas enjoying improved management practices, will allow to maintain and eventually start an increase in sustainable yields (1). The net difference between the With and Without Project scenarios in pine forest utilization is presented in Table 3. Savings in total used logs accomplished along the first 17 years allow to sustain production the remaining 13 years. After year 15 instead of becoming a net importer, with the project Honduras maintains its volume of exports at 121 MMBF/year.

3. Production Costs. All these costs are financial costs expressed in constant lempiras or dollars of 1985. Financial costs refer to costs calculated at prevailing market prices.

3.1 Logging. Unit costs of logging (Table 4) have been broken down into: felling, skidding, transportation and provision of roads.

---

(1) Table 16 shows second-growth yields from an area twice the size of "La Union", no more than 20% of total forest land in the country. By year 30 such area will have already produced 1.4 million cubic meters, and its annual production will represent 35% of total Honduras' production.

The first two columns of Table 4 present the purchase and the current value of the capital stock per cubic meter of logs taken out of the forest. Column 3 refers to replacement or depreciation expenditures to maintain the capital stock in working conditions. Labor refers to unskilled labor, while management represents skilled labor employment. Wood losses inevitably occur at each stage with the handling of the logs. Data costs on Table 4 do not include any return on capital or profit for the logging operation, nor stumpage costs.

It was estimated that with project unit costs would be slightly higher in felling and skidding, but compensated by slightly lower unit costs in roads. Therefore, unit costs of Table 4 adequately represent average costs for both With and Without Project scenarios.

3.2 Sawmills. Table 5 presents the unit costs for a typical circular mill and for a typical band sawmill. These costs do not include the cost of logs used as input, which depends on the efficiency index - board feet of lumber per cubic meter of logs. Neither do these costs include any consideration for profits or returns to capital.

Table 6 shows the projected share of circular and band mills both in sawnwood production and in log use, the evolution of productivity coefficients for each type of sawmill, and the total average. The productivity coefficients increase for both circular and band mills. Additionally, there is a gradual shift from circular to band mills, resulting in a faster growth of the total productivity coefficients. All figures stabilize from year 10 on.

3.3 Additional Unit Costs. After the logs are sawn, the lumber goes through processes called drying and planing. Residual pieces of lumber and also lesser quality lumber are used to manufacture broom and tomato sticks. There are also the transportation costs both for exports and for the local markets, and addittional lumber costs associated with exports. All these unit financial costs are presented in Table 7, by components: foreign exchange, unskilled labor and other domestic currency costs.

3.4 Aggregation of Logging and Milling Costs. All operating costs (investment costs excluded) incurred from the start of the logging operation, to the finished lumber at millgate have been aggregated in Table 8. These financial costs refer to the With Project situation; however, year 1 costs represent also the stable unit costs of the Without Project scenario. Neither stumpage and export taxes, nor profits and investment costs are included in these costs figures.

4. Aggregation of Financial Costs and Revenues. Tables 9 and 10 respectively present the Without and With Project total financial costs and revenues in constant Lempiras of 1985. As before, financial values are those calculated at prevailing market prices. Starting from annual production levels of lumber plus domestic consumption and net exports of Tables 1 and 2, and using unit costs of Tables 7 and 8, total annual Operation Costs are calculated.

Net investment figures for fixed capital are calculated using the value of the capital stock as shown in Tables 4 and 5. Whenever there is an increase in production, net investment is estimated based upon purchase value of capital stock, and if production decreases the disinvestment figures are drawn on the current value

of the capital stock. The residual value of the capital stock is also calculated from unit current value figures of Tables 4 and 5. The stock of working capital is calculated at 20% of total operation costs. Whenever operation costs increase, there is an increase in working capital, and when operation costs decrease, there is a negative figure or decrement in working capital.

4.1 Export Prices FOB prices for Honduras' pine lumber exports have increased from 360 $/MBF to 378 $/MBF in the period 1983-85, when calculated in constant 1985 dollars (Table 11). Prices decreased in 1986 because stocks of lower quality lumber were liquidated.

4.2 Domestic prices Table 12 gives annual average domestic prices of pine sawnwood, for sales in Tegucigalpa, San Pedro Sula and Ceiba. Those sales cover 87.6 percent of total domestic sales.

Domestic prices are fairly close to export prices for pine sawnwood. Furthermore, since pine lumber is an exportable commodity, its opportunity cost or economic price must be the export price.

4.3 Price projections For the quantification of benefits or revenues, an expected export price of 375 $/MBF (750 L/MBF) was adopted throughout the project. The domestic price for the same quality lumber is 517.5 L/MBF. The difference between both prices is explained as follows:

	L/MBF
FOB price of lumber exports	750.0
Export tariff	-112.5
Differential in transportation costs	- 20.0
Additional export costs	-100.0
Domestic producer-price of lumber	517.5

Furthermore, a price of L 550 per MBF was adopted for broom sticks' exports. CIF price of lumber imports were estimated to be 20% higher than the FOB export price. The future price for lumber is taken as constant, since World Bank price projections for non-coniferous wood, a close substitute for Honduras' lumber, are also constant.

In order to properly quantify benefits, the domestic price of lumber of 517.5 L/MBF is maintained even if such lumber is imported at a higher price. With the project domestic consumption can be supplied at a 517.5 L/MBF price. The benefits derived from one MBF of lumber are meassured at L517.5. Without the project it will cost more to obtain one MBF from a foreign supplier, but the benefits derived from the lumber will have not changed. The difference will bring a net income loss to the economy.

5. Financial Profits and Taxes. Tables 13 and 14 present total figures of profits and taxes, and also unit values per cubic meter of logs brought to the mills. Total revenue figures refer to sales of domestic production both in local and export markets. Gross profits are obtained after deducting from total revenue the operational costs. Thus, investment costs have not been considered as costs for the estimation of gross profits.

Export tariffs are fixed as 15% of the FOB value of exports. Stumpage is fixed at 12 L/m3 in the Without-Project scenario. For the With-Project situation it has been estimated that export tariffs will remain at their current level (15%), and that stumpage will take 50% of profits after deducting export taxes, or at least maintain the present level of 12 L/m3 of logs. Figures in Lempiras of 1985 per cubic meter refer to cubic meter of logs taken out from the forests. Thus, as soon as the proportion of exports in domestic production declines, so does the value of export tariffs per cubic meter of logs.

6. Project Costs. The contributions of both, AID and the GOH have been calculated in Table 15, disaggregating local currency and foreign currency expenditures. Furthermore, the GOH contribution has been disaggregated between the Forest Management component, and other GOH expenditures. None of these resources are asigned to cover unskilled labor costs. It has been considered that from year 8 on, the GOH will be the sole source for all expenditures required to maintain the project functioning according to the present design.

7. Economic Costs and Benefits. To calculate economic costs and benefits, opportunity costs or shadow prices have to be taken into account, and the value of some project inputs has to be recalculated.

7.1 Wage Rate for Unskilled Labor. The are some indications that the rate of unemployment of unskilled labor is high in Honduras (1). Therefore, the GOH assigns high priority to finding new employment opportunities for unskilled labor. Considering the apparently high unemployment rate of unskilled labor, the opportunity cost of such labor should be fairly low. Lacking more precise computations, the opportunity cost or shadow price of unskilled labor has been estimated at 50% of financial or market rates.

7.2 Shadow Exchange Rate. The standard correction factor (SCF) for the shadow price of foreign exchange was estimated at 1.35, considering that the real trade weighted effective

---

(1) The rate of unemployment has increased from 11.3% in 1974 to 25% in 1984, according to "Plan Nacional de Desarrollo 1987-1990". Secretaría de Planificación, Coordinación y Presupuesto.

exchange rate had fallen to around 75% by 1985 taking 1978 as base year(1). This means that the shadow exchange rate is:

$$SER = SCF \times OER = 1.35 \times 2 = 2.70 \text{ L/US\$},$$

where OER refers to the official exchange rate.

7.3 Economic Price of Lumber. The economic price of lumber exports is just their FOB export price. However, the domestic price of such lumber is its opportunity price calculated as follows:

	L/MBF
FOB price of lumber exports	750
Differential in transportation costs	-20
Additional export costs	-100
Opportunity price of localy consumed lumber	630

The 630 L/MBF price is applied to all domestically consumed lumber regardless of its origen. If the lumber is imported, its economic cost is the CIF price of imported lumber, 900 L/MBF. Thus, the economy incurrs in a net loss of 270 L/MBF when consuming imported lumber.

7.4 Improved Forest Management. One of the main components of the project will be to improve forest management in the area of "La Unión", Olancho Department, starting from year 1; and also in a second similar forest area beginning in year 4 of the project. The greatest benefits of the improved forest management practices will be accrued in the future, when those areas placed under improved management during the project's life bring much higher yields according to projected figures provided by COHDEFOR.

(1) IMF report on Honduras, 2/87.

Theoretical yields for the second growth of a forest area enjoying improved management practices are:

27.4 m3/ha, on year 20
36.1 m3/ha, on year 24
42.1 m3/ha, on year 29
263.9 m3/ha, on year 40

These are yields for logs with minimum diameter of 15 cm. From the above data, effective yield figures are obtained after deducting 8% due to inaccessibility and other wood losses, and on the final cut substracting an additional 15 m3/ha for seed trees. Without project yields (in the second growth harvest) estimated at most at 25 m3/ha are also deducted from year 40 yields, to obtain the additional production attributable to the project.

Annual logged areas have been calculated assuming that the forest area "La Unión" is exploited in 40 years. Furthermore, from year 4 on this area is duplicated to take into account the extension of the Improved Forest Management component into "AREA 2", which supposedly will be equivalent to "La Unión". The value of the additional logs is calculated after deducting from the sale value of lumber all operating and investment costs.

During the first 20 years of the project, the Forest Management component absorbs resources, it is a net consumer. Only after year 20 does this project component generates resources in excess of expenditures. By year 60 the net contribution of the Forest Management component exceeds L100 million a year.

The ERR of the Forest Management component is a modest 10.7%. However, one must be aware that this particular project component will bring large external benefits. That is, its most important benefits will be registered outside the boundaries of the project. First, improved forest management practices will deter soil erosion. Second, this component of the project will serve as a pilot experience. The know-how gained at "La Unión" and "Area 2" will be used by the GOH to implement elsewhere in the country proved better forest management practices.

To offer a better assesment of net benefits from the Forest Management component, perhaps it is more fair to consider the first 30 years of forest management expenditures as pertaining to the entire project. Doing so, the present value of net benefits at year 30 is L264 million, using the ERR of the entire project as the discount rate. This present value figure is introduced in Table 17 to represent the residual value at year 30, of the additional wood generated by the Forest Management component.

7.5 Aggregated Figures. Table 17 presents aggregated figures of "Economic Costs and Benefits" of the project for the base value of economic parameters:

- shadow price factor for unskilled labor = 50%
- correction factor for foreign exchange = 1.35
- opportunity cost of locally consumed lumber = 630 L/MBF

"Foregone Benefits" are net benefits without project, that is "Revenues minus Costs" of Table 9, but with figures computed using economic instead of financial prices. In the same

manner, "Benefits" correspond to net benefits with project, that is "Revenues minus Costs" or Table 10. GOH expenditure substitutes AID expenditure after year 7. GOH expenditure includes the first 30 years if Project expenditure in forest management of selected areas.

The obtained 21.9% for the Economic Internal Rate of Return amply justifies the project on economic grounds. It confirms the presumption that forestry investments in Honduras are profitable, in spite of the long gestation period characteristic of this type of projects. Ignoring the less profitable (10.7% ERR) Forest Management component, the ERR of the project increases to 25.7%.

The project is a net consumer of resources during its first 4 years. From years 5 to 16 it provides a positive but still meager net contribution. Afterwards net benefits of the project grow rapidly, exceeding L90 million a year after year 21. Thus, the main benefits of this project will be reaped 20 years from its start, by a new generation of Hondurans.

7.6 Sensitivity Analysis.

The purpose of the sensitivity analysis is to highlight the factors that are critical in establishing the actual ERR of the project. In order to identify those factors or events that could turn the project unprofitable, several scenarios, alternative to the basic scenario, have been tried.

a) One of the key assumption on which the success of the project rests is the improvement in the efficiency of the exploitation of pine forests. Without the project, 20% of the usable logs are abandoned during harvest. With the project all these logs are assumed to be used productively. However, for some reason the project may fail to eliminate all the waste in the logging operation. Table 2-A shows the projection of commercial pine utilization if a 10% waste of logs still persists in the With Project scenario. In these conditions, the ERR becomes 20.6%. Therefore, the project's economic profitability shows weak dependence on the quantity of logs abandoned during harvests.

b) Another key factor for the success of the project is the improvement in the efficiency of the forestry industry. Table 6 shows that with the project the productivity coefficient of sawmills is expected to increase from a current value of 191 BF/m3 to 254BF/m3 during a 10 year period. Without the project the current value of 191 BF/m3 would prevail during the project's horizon.

The question is what would happen if the productivity index grows only up to 223 BF/m3 in the 10 year period (50% of the expected improvement). Tables 2-B and 6-B show the projection of pine production and the productivity coefficients respectively for this alternative scenario. The ERR falls to 15.7%. Thus the economic profitability of the project shows a somewhat stronger dependence on the efficient operation of sawmills.

c) A 20% decrease in the sale value of pine sawnwood and broom sticks in the domestic and foreign markets would lower the ERR to only 19.4%, showing that the ERR is not highly sensitive to sale prices of sawnwood.

d) Total Costs - that is operational, investment, drying and planing, and transportation costs - in the With Project scenario increase by 10%. This reduces the ERR to 12.0%; thus, the ERR is fairly sensitive to changes in expected costs of the With Project scenario.

8. The Project and GOH Accounts

From the perspective of the GOH accounts, the project represents an expenditure of public financial resources. Furthermore, the project changes tax revenues collected from the forestry activity. Tax revenues will change with the project because of two factors.

First, the project allows present export volumes to be sustained along the 30 year horizon, thanks to a more efficient use of a reduced quantity of logs. Without the project, exports decrease after year 15, and from year 19 on Honduras exports only broom sticks (Tables 1, 2 and 3).

Second, the project stumpage fee gradually increases from the present level of 12 L/m3 to an average of 15 L/m3 by year 12 (Tables 13 and 14). This increase in stumpage is aimed to collect at least 50% of gross profits after deducting export variffs. It is important to notice that this increase in stumpage is feasible since it will allow the forestry industry to still increase unit profits from 11 L/m3 to 33 L/m3 (Table 14).

Table 18 shows the increase in tax revenues that will be possible with the project. Deducting from the tax increase the additional

expenditures of the GOH in the implementation and management of the project, the net gain in GOH income is obtained. With the project the GOH would experiment a net deficit during the first 15 years. From then on the project would be a net contributor of increasingly large financial resources to the GOH.

9. The Project and Foreign Exchange Use

Another important consideration pertaining to public investment projects is the project's impact on the availability of foreign exchange. In the present situation the availability of foreign exchange to finance essential imports become the main restriction for the expansion of domestic GDP. The scarcity of foreign exchange has been incorporated into the economic analysis by means of the shadow exchange rate. Still however, it is important to examine the performance of the project with respect to its net foreign exchange contribution. Table 19 shows total foreign exchange expenditure in forestry with and without the project. It also shows with and without project forestry exports. The last column of Table 19 presents the net gain in foreign exchange. The project is a net contributor of foreign exchange in every year of its horizon. In 30 years the project contributes with a total of $620 million, starting from $966 thousand on year 2, and exceeding $45 million per year after year 22.

10. Employment and Labor Income

The implementation of the project will reduce logging activities during its first 15 years, because the introduction of more efficient practices will require the harvest of less hectares of forest.. Since logging is intensive in unskilled labor employment, with the project there will be an employment contraction the first 15 project years (Table 20). However, at the same time and especially the first 5 project years, there will

be an expansion in the employment of skilled labor. As a result of this combination, labor income will increase while employment decreases during years 1 to 6. Then, from year 7 to year 15, labor income and employment will both be lower in the With Project scenario.

After year 15, the project will provide important contributions to labor income and employment. It is interesting to notice that the project will not add to present levels of labor income and employment. It will merely preserve those levels from shrinking as in the Without Project situation.

11. Increment of GDP

The project will represent a net contribution to GDP in two ways. Initially, forestry output will be sustained using less resources both in logging as well as in milling of pine wood. After year 15, the project will further increase its net contribution to GDP by being able to sustain the production of sawnwood. Forests saved during the first 17 years will then be available thanks to the more efficient production methods.

Table 21 calculates the additional GDP attributable to the project. Additional investment costs have been added to the net economic benefits, because investment expenditures are not a deduction from final output when measuring value added or GDP. Replacement costs were not considered when calculating net economic benefits, because replacement costs are also part of investment expenditures. Furthermore, ATD and GOH expenditures have also been added since these expenditures refer to investment and labor costs of support activities and therefore must not be deducted from final output to obtain GDP.

The last column of Table 21 shows thus the increments in GDP made possible by the project. In calculating these figures, only the direct contribution to GDP was considered, That is to say, multiplier effects were totally ignored.

During the first 15 years the project generates a modest output increase, of up to L6 million per year. Then the contribution to GDP grows rapidly to exceed L28 million a year during the last 8 years. Thus once again, it is evident that the bulk of benefits brought out by this project will be experienced after at least 20 years. That is, the future generation will enjoy the benefits made possible by present generation actions.

12. Key Issues

The success of the project rests on a number of factors. Some of those factors are more critical because either there are reasons to expect difficulties in meeting the project's requirements, or those factors are not under direct control of the project managers

12.1 New Stumpage Regulations. The factor that could affect most the successful implementation of the project is perhaps the enactment of the new stumpage regulations. Changing the base of the stumpage from volume of logs brought to the mill, to volume of logs available in the forest, and also increasing the stumpage rate so that at least 50% of gross profits are collected as taxes, will surely meet opposition from both sawmills and logging operations. Thus, it will not be easy toput into effect the planned new stumpage regulations. However, the failure to enforce those regulations would mean that none of the intended improvements will happen.

Without the new stumpage regulations, the 20% waste of logs in logging would likely continue and sawmills would keep working at current efficiency levels. There would be no incentive for a particular producer to improve its logging and milling methods and thus save forests for future harvests. This is a case where the well-being of the producers will increase only if they are all forced to adopt the more efficient practices, because the benefits of saving forests for future use will be enjoyed by all producers, not just by the producers that actually help save the forests.

12.2 Efficiency of Sawmill Industry. Another key factor for the success of the project is the improvement in the efficiency of the sawmill industry. The substitution of circular mills by the more efficient band mills should be the main force for the expected improvement. At the same time the efficiency of bandmills is supposed to increase by 24%, while that of the remaining circular mills should increase by 30%. These improvements in efficiency should result in spite of processing also some lower quality logs presently rejected by the mills. However, some managers of sawmill operations may be reluctant to change. Forcing their suppliers to keep wasting the lower quality logs, these managers may be able to preserve their profitability without adopting any improved practice. This behaviour would be encouraged by any weakness in the enforcement of the new stumpage regulations.

12.3 Improved Forest Management Practices. In the long run, another factor that may hinder the development of the project is the failure to implement improved forest management practices, or if those practices do not bring the expected increases in yields of second growth forests. Through the application of improved methods, the project will allow

Honduras to sustain for 30 years instead of 15 a significant production level based on the harvesting of present forests. Still those forests will inevitably be depleted after 30 years, unless then second growth forests start showing the higher and earlier yields that are expected from them with the application of improved forest management practices. Since this is such a long term undertaking, it may easily be given low priority. Defects and shortcomings in its correct development will be hard to spot until it is too late to solve them on schedule. As a result of this, soil erosion could proceed at a faster rate, and the country find itself depleted of forests in at most 30 more years.

It is important to note that the success in the application of improved management practices will greatly depend on the capacity to share an adequate portion of project benefits with both, farmers having forest suitable land and landless farmers who expect to derive some income from public forest land.

TABLE 1

PROJECTION OF COMMERCIAL PINE FOREST UTILIZATION WITHOUT PROJECT

Project Year	Sawmill Yield	LOGS Delivered to mill	LOGS Lost in Harvest	LOGS Total used	LUMBER Lumber Production	LUMBER Broom Sticks	LUMBER Total Production	LUMBER Domestic Market	LUMBER Net Exports
	(BF/m3)	(Thousands of cubic meters)			(Millions of board feet)				
1	191	916	229	1,145	175	12	187	66	121
2	191	927	232	1,158	177	12	189	68	121
3	191	937	234	1,171	179	13	192	70	122
4	191	942	236	1,178	180	13	193	72	121
5	191	953	238	1,191	182	13	195	74	121
6	191	963	241	1,204	184	13	197	76	121
7	191	979	245	1,224	187	13	200	79	121
8	191	990	247	1,237	189	13	202	81	121
9	191	1,000	250	1,250	191	13	204	83	121
10	191	1,010	253	1,263	193	14	207	86	121
11	191	1,010	253	1,263	193	14	207	86	121
12	191	1,010	253	1,263	193	14	207	86	121
13	191	1,010	253	1,263	193	14	207	86	121
14	191	1,010	253	1,263	193	14	207	86	121
15	191	1,010	253	1,263	193	14	207	86	121
16	191	800	202	1,008	154	11	165	86	79
17	191	649	162	812	124	9	133	86	47
18	191	518	130	648	99	7	106	86	20
19	191	414	103	517	79	6	85	86	-1
20	191	330	82	412	63	4	67	86	-19
21	191	267	67	334	51	4	55	86	-31
22	191	215	54	268	41	3	44	86	-42
23	191	173	43	216	33	2	35	86	-51
24	191	173	43	216	33	2	35	86	-51
25	191	173	43	216	33	2	35	86	-51
26	191	173	43	216	33	2	35	86	-51
27	191	173	43	216	33	2	35	86	-51
28	191	173	43	216	33	2	35	86	-51
29	191	173	43	216	33	2	35	86	-51
30	191	173	43	216	33	2	35	86	-51
TOTAL		19,251	4,813	24,064	3,677	257	3,934	2,475	1,459

Source: RD/AID projections (Ramon Alvarez).

TABLE 2

PROJECTION OF COMMERCIAL PINE FOREST UTILIZATION WITH PROJECT

Project Year	Sawmill Yield	LOGS Delivered to mill	LOGS Lost in Harvest	LOGS Total used	LUMBER Lumber Production	LUMBER Broom Sticks	LUMBER Total Production	LUMBER Domestic Market	LUMBER Exports
	(BF/m3)	(Thousands of cubic meters)			(Millions of board feet)				
1	191	916	229	1,145	175	12	187	66	121
2	195	908	101	1,009	177	12	189	68	121
3	200	895	47	942	179	13	192	70	122
4	208	865		865	180	13	193	72	121
5	218	843		843	182	13	195	74	121
6	224	821		821	184	13	197	76	121
7	232	806		806	187	13	200	79	121
8	240	788		788	189	13	202	81	121
9	245	780		780	191	13	204	83	121
10	250	772		772	193	14	207	86	121
11	254	760		760	193	14	207	86	121
12	254	760		760	193	14	207	86	121
13	254	760		760	193	14	207	86	121
14	254	760		760	193	14	207	86	121
15	254	760		760	193	14	207	86	121
16	254	760		760	193	14	207	86	121
17	254	760		760	193	14	207	86	121
18	254	760		760	193	14	207	86	121
19	254	760		760	193	14	207	86	121
20	254	760		760	193	14	207	86	121
21	254	760		760	193	14	207	86	121
22	254	760		760	193	14	207	86	121
23	254	760		760	193	14	207	86	121
24	254	760		760	193	14	207	86	121
25	254	760		760	193	14	207	86	121
26	254	760		760	193	14	207	86	121
27	254	760		760	193	14	207	86	121
28	254	760		760	193	14	207	86	121
29	254	760		760	193	14	207	86	121
30	254	760		760	193	14	207	86	121
TOTAL		23,590	377	23,967	5,697	399	6,096	2,475	3,621

Source: RD/AID projections (Ramon Alvarez).

15-Apr-87 FORECON.WK1 WGomez/BPA/AID

TABLE 3

DIFFERENCE BETWEEN THE WITH PROJECT AND WITHOUT PROJECT SCENARIOS

		LOGS			LUMBER				
Project Year	Sawmill Yield	Delivered to mill	Lost in Harvest	Total used	Lumber Production	Broom Sticks	Total Production	Domestic Market	Net Exports
	(BF/m3)	(Thousands of cubic meters)			(Millions of board feet)				
1	0	0	(0)	(0)	0	0	0	0	0
2	4	(19)	(131)	(150)	0	0	0	0	0
3	9	(42)	(187)	(229)	0	0	0	0	0
4	17	(77)	(236)	(313)	0	0	0	0	0
5	25	(110)	(238)	(349)	0	0	0	0	0
6	33	(142)	(241)	(383)	0	0	0	0	0
7	41	(173)	(245)	(418)	0	0	0	0	0
8	49	(202)	(247)	(449)	0	0	0	0	0
9	54	(220)	(250)	(470)	0	0	0	0	0
10	59	(238)	(253)	(491)	0	0	0	0	0
11	63	(251)	(253)	(503)	0	0	0	0	0
12	63	(251)	(253)	(503)	0	0	0	0	0
13	63	(251)	(253)	(503)	0	0	0	0	0
14	63	(251)	(253)	(503)	0	0	0	0	0
15	63	(251)	(253)	(503)	0	0	0	0	0
16	63	(46)	(202)	(248)	39	3	42	0	42
17	63	111	(162)	(52)	69	5	74	0	74
18	63	242	(130)	112	94	7	101	0	101
19	63	346	(103)	243	114	8	122	0	122
20	63	430	(82)	348	130	9	139	0	139
21	63	493	(67)	426	142	10	152	0	152
22	63	545	(54)	492	152	11	163	0	163
23	63	587	(43)	544	160	11	171	0	171
24	63	587	(43)	544	160	11	171	0	171
25	63	587	(43)	544	160	11	171	0	171
26	63	587	(43)	544	160	11	171	0	171
27	63	587	(43)	544	160	11	171	0	171
28	63	587	(43)	544	160	11	171	0	171
29	63	587	(43)	544	160	11	171	0	171
30	63	587	(43)	544	160	11	171	0	171
TOTAL		4,339	(4,436)	(97)	2,020	141	2,161	0	2,161

Source: Tables 1 and 2.

TABLE 4

FINANCIAL UNIT COSTS OF LOGGING
(Lempiras of 1985 per cubic meter)

	Value of Capital Stock Purchase	Current	Replacement Costs	Labor	Fuel	Mainten.	Sub-Total	Wood Management Losses	0.10	TOTAL
Felling	0.19	0.19	0.43	0.69	1.03	0.36	2.70	0.32	0.27	3.30
Skiding	33.75	15.58	3.44	1.33	2.57	3.84	11.19	0.89	1.12	13.20
Transportation	25.25	14.73	4.54	3.35	6.36	5.04	19.30	0.77	1.93	22.00
Roads	6.81	3.97	1.23	1.27	0.66	1.35	4.51	0.54	0.45	5.50
TOTAL	65.99	34.47	9.64	6.85	10.63	10.59	37.70	2.53	3.77	44.00

Source: ED/AID estimates (Ramon Alvarez).

TABLE 5

FINANCIAL UNIT COSTS FOR TYPICAL WOOD MILLS
(Lempiras of 1985)

	CIRCULAR MILL (L)	(L/MBF)	BAND MILL (L)	(L/MBF)
Capital Stock				
Purchase value	160,000	88.89	390,000	74.86
Current value	80,000	44.44	195,000	37.43
Skilled labor	8,820	4.90	15,354	2.95
Unskilled labor	71,953	39.97	125,254	24.04
Administration	28,288	15.70	118,850	22.81
Fuel	57,750	32.08	42,451	8.15
Maintenance	24,000	13.33	94,093	18.06
Replacement	16,000	8.89	38,554	7.40
Total costs	206,789	114.88	434,556	83.41
Production capacity:	1,800 MBF/year		5,210 MBF/year	

Note: The real price of fuel is assumed to decrease by 16% with respect to 1985 prices.
Source: Stumpage Appraisal, Winrock International, July 1984.

TABLE 6

PRODUCTIVITY COEFFICIENTS OF SAWMILLS WITH-PROJECT

Project Year	Share in Sawnwood Circular Mills (%)	Share in Sawnwood Band Mills (%)	Share in Log use Circular Mills (%)	Share in Log use Band Mills (%)	Productivity Coefficients (BF/m3) Circular Mills	Productivity Coefficients (BF/m3) Band Mills	Productivity Coefficients (BF/m3) Total
1	40	60	44.94	55.06	170	208	191
2	35	65	39.98	60.02	175	217	200
3	30	70	34.77	65.23	180	224	209
4	25	75	29.34	70.66	186	231	218
5	20	80	23.73	76.27	191	238	227
6	15	85	17.96	82.04	197	245	236
7	10	90	12.07	87.93	203	251	245
8	10	90	11.86	88.14	209	253	248
9	10	90	11.66	88.34	215	256	251
10	10	90	11.45	88.55	222	258	254

Source: RD/AID projections (Ramon Alvarez).

TABLE 7

ADDITIONAL UNIT COSTS

(Lempiras of 1985 per thousand board feet)

	Foreign exchange	Unskilled labor	Other	TOTAL
Transportation for exports	49.50		5.50	55.00
Transportation for domestic markets	31.50		3.50	35.00
Production cost of broom sticks	53.15	122.44	24.49	200.08
Drying and planing	21.32	12.79	8.53	42.64
Additional lumber export costs	70.00	30.00		100.00

Source: Stumpage Appraisal, Winrock International, July 1984, and RD/AID estimates (Ramon Alvarez).

18

TABLE 8

WITH PROJECT LOGGING AND MILLING
UNIT OPERATING COSTS

(Lempiras of 1985 per thousand board feet)

Project Year	Logging	Milling	Drying & Planing	TOTAL
1	230	96	43	369
2	220	94	43	357
3	211	93	43	346
4	202	91	43	336
5	194	90	43	326
6	186	88	43	317
7	180	87	43	309
8	177	87	43	307
9	175	87	43	304
10	173	87	43	302

Source: Tables 4, 5, 6 and 7.

TABLE 9

WITHOUT PROJECT FINANCIAL COSTS AND REVENUES

(Thousands of 1985 Lempiras)

Project Year	OPERATING COSTS Lumber	Broom sticks	TRANSPORTATION COSTS Domestic Market	Exports Imports	Ship Loading	Imports Costs	TOTAL OPERATION COSTS	NET INVESTMENT Logging	Mills	Working Capital	Total Net Investment	TOTAL COSTS	REVENUES Domestic Market	Exports	TOTAL REVENUES	REVENUES MINUS COSTS
1	64,576	2,451	2,310	6,669	12,125		88,131	31,584	7,041	17,626	56,251	144,382	34,155	88,537	122,692	(21,690)
2	65,314	2,479	2,380	6,676	12,139		88,988	691	161	172	1,024	90,012	35,190	88,614	123,804	33,792
3	66,052	2,507	2,450	6,684	12,153		89,846	691	161	172	1,024	90,869	36,225	88,692	124,917	34,047
4	66,421	2,521	2,520	6,633	12,060		90,155	346	80	62	488	90,643	37,260	87,980	125,240	34,598
5	67,159	2,549	2,590	6,641	12,074		91,013	691	161	172	1,024	92,036	38,295	88,058	126,353	34,317
6	67,897	2,577	2,660	6,648	12,088		91,870	691	161	172	1,024	92,894	39,330	88,136	127,466	34,572
7	69,004	2,619	2,765	6,660	12,109		93,157	1,037	241	257	1,535	94,692	40,883	88,252	129,134	34,442
8	69,742	2,647	2,835	6,668	12,123		94,015	691	161	172	1,024	95,038	41,918	88,329	130,247	35,209
9	70,480	2,675	2,905	6,675	12,137		94,872	691	161	172	1,024	95,896	42,953	88,407	131,359	35,464
10	71,218	2,703	3,010	6,628	12,051		95,610	691	161	148	1,000	96,610	44,505	87,735	132,240	35,630
11	71,218	2,703	3,010	6,628	12,051		95,610	0	0	0	0	95,610	44,505	87,735	132,240	36,630
12	71,218	2,703	3,010	6,628	12,051		95,610	0	0	0	0	95,610	44,505	87,735	132,240	36,630
13	71,218	2,703	3,010	6,628	12,051		95,610	0	0	0	0	95,610	44,505	87,735	132,240	36,630
14	71,218	2,703	3,010	6,628	12,051		95,610	0	0	0	0	95,610	44,505	87,735	132,240	36,630
15	71,218	2,703	3,010	6,628	12,051		95,610	0	0	0	0	95,610	44,505	87,735	132,240	36,630
16	56,827	2,157	3,010	4,333	7,878		74,204	(7,039)	(1,569)	(4,281)	(12,889)	61,315	44,505	56,972	101,477	40,162
17	45,757	1,737	3,010	2,557	4,668		57,739	(5,414)	(1,207)	(3,293)	(9,915)	47,824	44,505	33,309	77,814	29,990
18	36,531	1,387	3,010	1,036	1,993		44,017	(4,512)	(1,006)	(2,744)	(8,262)	35,755	44,505	13,589	58,094	22,339
19	29,151	1,106	2,959	689	553	6,300	40,758	(3,610)	(805)	(652)	(5,066)	35,692	44,505	3,064	47,569	11,876
20	23,247	882	2,359	1,508	441	20,700	49,138	(2,888)	(644)	1,676	(1,856)	47,282	44,505	2,443	46,948	(334)
21	18,819	714	1,910	2,121	357	31,500	55,422	(2,166)	(483)	1,257	(1,392)	54,030	44,505	1,978	46,483	(7,547)
22	15,129	574	1,535	2,633	287	40,500	60,659	(1,805)	(402)	1,047	(1,160)	59,499	44,505	1,590	46,095	(13,404)
23	12,177	462	1,236	3,042	231	47,700	64,848	(1,444)	(322)	838	(928)	63,920	44,505	1,280	45,785	(18,135)
24	12,177	462	1,236	3,042	231	47,700	64,848	0	0	0	0	64,848	44,505	1,280	45,785	(19,063)
25	12,177	462	1,236	3,042	231	47,700	64,848	0	0	0	0	64,848	44,505	1,280	45,785	(19,063)
26	12,177	462	1,236	3,042	231	47,700	64,848	0	0	0	0	64,848	44,505	1,280	45,785	(19,063)
27	12,177	462	1,236	3,042	231	47,700	64,848	0	0	0	0	64,848	44,505	1,280	45,785	(19,063)
28	12,177	462	1,236	3,042	231	47,700	64,848	0	0	0	0	64,848	44,505	1,280	45,785	(19,063)
29	12,177	462	1,236	3,042	231	47,700	64,848	0	0	0	0	64,848	44,505	1,280	45,785	(19,063)
30	12,177	462	1,236	3,042	231	47,700	64,848	(5,956)	(1,328)	(12,970)	(20,253)	44,595	44,505	1,280	45,785	1,190

Source: Tables 1, 4, 5, 7 and 8.

15-Apr-87 FORECON.WK1 WGomez/EPA/AID

TABLE 10

WITH PROJECT FINANCIAL COSTS AND REVENUES

(Thousands of 1985 Lempiras)

Project Year	OPERATING COSTS Lumber	OPERATING COSTS Broom sticks	TRANSPORTATION COSTS Domestic Market	TRANSPORTATION COSTS Exports Imports	Ship Loading	Imports Costs	TOTAL OPERATION COSTS	NET INVESTMENT Logging	NET INVESTMENT Mills	NET INVESTMENT Working Capital	Total Net Investment	TOTAL COSTS	REVENUES Domestic Market	REVENUES Exports	TOTAL REVENUES	REVENUES MINUS COSTS
1	64,576	2,451	2,310	6,669	12,125		88,131	31,584	7,041	17,626	56,251	144,382	34,155	88,537	122,692	(21,690)
2	63,200	2,479	2,380	6,676	12,139		86,875	617	161	(251)	587	87,461	35,190	88,614	123,804	36,343
3	61,937	2,507	2,450	6,684	12,153		85,731	660	161	(229)	592	86,323	36,225	88,692	124,917	38,593
4	60,435	2,521	2,520	6,633	12,060		84,169	317	80	(312)	85	84,255	37,260	87,980	125,240	40,986
5	59,364	2,549	2,590	6,641	12,074		83,218	611	161	(190)	582	83,799	38,295	88,058	126,353	42,554
6	58,367	2,577	2,660	6,648	12,088		82,340	589	161	(176)	575	82,915	39,330	88,136	127,466	44,551
7	57,743	2,619	2,765	6,660	12,109		81,896	853	241	(89)	1,006	82,902	40,883	88,252	129,134	46,232
8	57,950	2,647	2,835	6,668	12,123		82,223	550	161	65	776	82,999	41,918	88,329	130,247	47,248
9	58,158	2,675	2,905	6,675	12,137		82,551	539	161	66	765	83,316	42,953	88,407	131,359	48,043
10	58,368	2,703	3,010	6,628	12,051		82,760	528	161	42	731	83,491	44,505	87,735	132,240	48,749
11	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
12	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
13	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
14	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
15	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
16	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
17	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
18	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
19	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
20	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
21	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
22	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
23	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
24	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
25	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
26	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
27	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
28	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
29	58,368	2,703	3,010	6,628	12,051		82,760	0	0	0	0	82,760	44,505	87,735	132,240	49,480
30	58,368	2,703	3,010	6,628	12,051		82,760	(26,193)	(7,765)	(16,552)	(50,510)	32,250	44,505	87,735	132,240	99,990

Source: Tables 2, 4, 5, 7 and 8.

15-Apr-87 FORECON.WK1 WGomez/EPA/AID

TABLE 11

HONDURAS PINE LUMBER EXPORTS

Year	Volume (m3x1000)	Value (million $)	Current Price ($/MBF)	M.U.V. %	Constant Price ($/MBF)
1983	262	40.4	364	101.0	360
1984	231	34.9	356	99.3	359
1985	213	34.1	378	100.0	378
1986	215	32.3	348	113.0	308

Note: 1 cubic meter = 424 board feet
Source: Central Bank of Honduras.
World Bank, Economic Analysis Department. October 1986.

TABLE 12

DOMESTIC PRICES FOR PINE SAWNWOOD

Year	Current Price (L/MBF)	Price Level %	Constant Price (L/MBF)
1983	665	170.9	719
1984	701	178.9	725
1985	722	184.9	722
1986	762	195.0	730

Note: Wood price and price level refer to consumer prices.
Producer prices have been estimated from export prices, at 517.5 L/MBF.
Source: Central Bank of Honduras.

TABLE 13

WITHOUT-PROJECT PROFITS AND TAXES

Project Year	Total Revenue	Gross Profits	Stumpage	Export Tariffs	Total Taxes	Net Profits	Total Revenue	Gross Profits	Stumpage	Export Tariffs	Total Taxes	Net Profits
	(Thousands of 1985 Lempiras)						(Lempiras of 1985 per cubic meter)					
1	122,692	34,561	10,995	13,280	24,275	10,286	134	38	12	14	26	11
2	123,804	34,816	11,120	13,292	24,413	10,403	134	38	12	14	26	11
3	124,917	35,071	11,246	13,304	24,550	10,521	133	37	12	14	26	11
4	125,240	35,086	11,309	13,197	24,506	10,580	133	37	12	14	26	11
5	126,353	35,340	11,435	13,209	24,643	10,697	133	37	12	14	26	11
6	127,466	35,595	11,560	13,220	24,781	10,815	132	37	12	14	26	11
7	129,134	35,978	11,749	13,238	24,986	10,991	132	37	12	14	26	11
8	130,247	36,232	11,874	13,249	25,124	11,109	132	37	12	13	25	11
9	131,359	36,487	12,000	13,261	25,261	11,226	131	36	12	13	25	11
10	132,240	36,630	12,126	13,160	25,286	11,344	131	36	12	13	25	11
11	132,240	36,630	12,126	13,160	25,286	11,344	131	36	12	13	25	11
12	132,240	36,630	12,126	13,160	25,286	11,344	131	36	12	13	25	11
13	132,240	36,630	12,126	13,160	25,286	11,344	131	36	12	13	25	11
14	132,240	36,630	12,126	13,160	25,286	11,344	131	36	12	13	25	11
15	132,240	36,630	12,126	13,160	25,286	11,344	131	36	12	13	25	11
16	101,477	27,273	9,675	8,546	18,221	9,051	126	34	12	12	23	11
17	77,814	20,075	7,791	4,996	12,787	7,288	120	31	12	8	20	11
18	58,094	14,077	6,220	2,038	8,258	5,819	112	27	12	4	16	11
19	41,084	7,204	4,963	460	5,423	1,782	99	17	12	1	13	4
20	32,763	5,745	3,958	366	4,325	1,421	99	17	12	1	13	4
21	26,523	4,651	3,204	297	3,501	1,150	99	17	12	1	13	4
22	21,322	3,739	2,576	238	2,814	925	99	17	12	1	13	4
23	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4
24	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4
25	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4
26	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4
27	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4
28	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4
29	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4
30	17,162	3,009	2,073	192	2,265	744	99	17	12	1	13	4

Source: Tables 1 and 9.

TABLE 14

WITH-PROJECT PROFITS AND TAXES

Project Year	Total Revenue	Gross Profits	Stumpage	Export Tariffs	Total Taxes	Net Additional Taxes	Net Profits	Revenue	Gross Profits	Stumpage	Export Tariffs	Taxes	Net Profits
	(Thousands of 1985 Lempiras)							(Lempiras of 1985 per cubic meter)					
1	122,692	34,561	10,995	13,280	24,275	0	10,286	134	38	12	14	26	11
2	123,804	36,929	10,892	13,292	24,184	(228)	12,745	136	41	12	15	27	14
3	124,917	39,195	10,740	13,304	24,044	(506)	15,142	140	44	12	15	27	17
4	125,240	41,671	10,385	13,197	23,582	(924)	17,489	145	47	12	15	27	20
5	126,353	43,135	10,111	13,209	23,320	(1,323)	19,815	150	51	12	16	28	24
6	127,466	45,125	9,857	13,220	23,077	(1,703)	22,048	155	55	12	16	28	27
7	129,134	47,239	10,381	13,238	23,619	(1,367)	23,619	160	59	13	16	29	29
8	130,247	49,024	10,763	13,249	24,012	(1,112)	24,012	165	61	14	17	30	30
9	131,359	49,889	11,143	13,261	24,404	(857)	24,404	169	63	14	17	31	31
10	132,240	49,480	11,580	13,160	24,740	(546)	24,740	171	64	15	17	32	32
11	132,240	49,480	11,580	13,160	24,740	(546)	24,740	174	65	15	17	33	33
12	132,240	49,480	11,580	13,160	24,740	(546)	24,740	174	65	15	17	33	33
13	132,240	49,480	11,580	13,160	24,740	(546)	24,740	174	65	15	17	33	33
14	132,240	49,480	11,580	13,160	24,740	(546)	24,740	174	65	15	17	33	33
15	132,240	49,480	11,580	13,160	24,740	(546)	24,740	174	65	15	17	33	33
16	132,240	49,480	11,580	13,160	24,740	6,512	24,740	174	65	15	17	33	33
17	132,240	49,480	11,580	13,160	24,740	11,953	24,740	174	65	15	17	33	33
18	132,240	49,480	11,580	13,160	24,740	16,482	24,740	174	65	15	17	33	33
19	132,240	49,480	11,580	13,160	24,740	19,317	24,740	174	65	15	17	33	33
20	132,240	49,480	11,580	13,160	24,740	20,415	24,740	174	65	15	17	33	33
21	132,240	49,480	11,580	13,160	24,740	21,239	24,740	174	65	15	17	33	33
22	132,240	49,480	11,580	13,160	24,740	21,925	24,740	174	65	15	17	33	33
23	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
24	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
25	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
26	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
27	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
28	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
29	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
30	132,240	49,480	11,580	13,160	24,740	22,475	24,740	174	65	15	17	33	33
					TOTAL	286,349							

Source: Tables 2 and 10.

TABLE II

AID AND GOH ADDITIONAL EXPENDITURES WITH PROJECT

(Thousands of 1985 Dollars)

Project Year	AID EXPENDITURE Local Currency	AID EXPENDITURE Foreign Currency	AID EXPENDITURE Total	EXPENDITURE OF THE GOVERNMENT OF HONDURAS: Forest Management Local Currency	Forest Management Foreign Currency	Other Local Currency	Other Foreign Currency	TOTAL Local Currency	TOTAL Foreign Currency	TOTAL Total
1	1,195	1,667	2,862	208	215	247	0	455	215	670
2	1,906	2,294	4,200	254	215	486	339	740	554	1,294
3	2,020	3,248	5,268	351	215	509	0	860	215	1,075
4	2,298	2,431	4,729	619	420	508	0	1,127	420	1,547
5	1,434	825	2,259	700	420	508	0	1,208	420	1,628
6	1,201	717	1,918	850	420	507	0	1,357	420	1,777
7	958	304	1,262	855	420	508	0	1,362	420	1,783
8 to 30				855	420	1312	188	2,167	608	2,775

Source: RD/AID projections (Ramon Alvarez).

TABLE 16

ECONOMIC VALUE OF ADDITIONAL LOGS FROM IMPROVED FOREST MANAGEMENT OF SELECTED AREAS

Project Year	Future Unit Yield	FUTURE ADDITIONAL PRODUCTION First Round	Second Round	TOTAL	GROSS PROFITS	INVESTMENT COSTS	FOREST MANAGEMENT	NET BENEFITS	Present Value of NET BENEFITS at Year 30 Excluding Management Costs in years 1 to 30
	(m3/ha)	(Thousands of cubic meters)				(Thousands of 1985 Lempiras)			
1							997	(997)	
2							1,089	(1,089)	
3							1,283	(1,283)	
4							2,372	(2,372)	
5							2,534	(2,534)	(L*1000)
6 to 19							2,834	(2,834)	
20	25	32	0	32	3,211	4,584	2,844	(4,217)	264,012
21		32	0	32	3,211	0	2,844	367	
22		32	0	32	3,211	0	2,844	367	
23		65	0	65	6,423	4,584	2,844	(1,006)	
24		65	0	65	6,423	0	2,844	3,579	
25	33	107	0	107	10,653	6,040	2,844	1,770	
26		107	0	107	10,653	0	2,844	7,809	
27		107	0	107	10,653	0	2,844	7,809	
28		150	0	150	14,884	6,040	2,844	6,000	
29		150	0	150	14,884	0	2,844	12,040	
30	39	199	0	199	19,818	7,044	2,844	9,931	
31		199	0	199	19,818	0	2,844	16,974	
32		199	0	199	19,818	0	2,844	16,974	
33		249	0	249	24,752	7,044	2,844	14,865	
34 TO 39		249	0	249	24,752	0	2,844	21,908	
40	203	509	0	509	50,586	36,879	2,844	10,863	
41		509	0	509	50,586	0	2,844	47,742	
42		509	0	509	50,586	0	2,844	47,742	
43		769	0	769	76,419	36,879	2,844	36,697	
44 TO 59		769	0	769	76,419	0	2,844	73,575	
60		737	32	769	76,419	0	2,844	73,575	
61		737	32	769	76,419	0	2,844	73,575	
62		737	32	769	76,419	0	2,844	73,575	
63		704	65	769	76,419	0	2,844	73,575	
64		704	65	769	76,419	0	2,844	73,575	
65		662	107	769	76,419	(0)	2,844	73,575	
66		662	107	769	76,419	0	2,844	73,575	
67		662	107	769	76,419	0	2,844	73,575	
68		619	150	769	76,419	0	2,844	73,575	
69		619	150	769	76,419	0	2,844	73,575	
70		570	199	769	76,419	(109,093)	2,844	182,668	

Source: Tables 4, 5, 14 and 15.

INTERNAL RATE OF RETURN 10.7 %

23-Apr-87 FORECON.WK1 WGomez/EPA/AID

TABLE 17

ECONOMIC COSTS AND BENEFITS

(Thousands of 1985 Lempiras)

Project Year	Foregone Benefits	AID Expenditure	GOH Expenditure	Production Costs	TOTAL COSTS	BENEFITS	NET BENEFITS
1	(15,954)	6,891	1,491	177,058	169,486	161,104	(8,381)
2	57,229	10,004	2,976	102,374	172,582	162,469	(10,113)
3	57,606	12,810	2,301	101,132	173,848	163,834	(10,014)
4	58,284	11,160	3,388	98,713	171,544	164,134	(7,411)
5	57,940	5,096	3,550	98,370	164,956	165,498	543
6	58,317	4,338	3,848	97,442	163,945	166,863	2,918
7	58,191	2,737	3,860	97,618	162,406	168,910	6,504
8	59,259		5,976	97,599	162,833	170,275	7,442
9	59,636		5,976	97,947	163,558	171,639	8,081
10	59,811		5,976	98,116	163,903	172,622	8,719
11	61,162		5,976	97,110	164,248	172,622	8,374
12	61,162		5,976	97,110	164,248	172,622	8,374
13	61,162		5,976	97,110	164,248	172,622	8,374
14	61,162		5,976	97,110	164,248	172,622	8,374
15	61,162		5,976	97,110	164,248	172,622	8,374
16	61,753		5,976	97,110	164,839	172,622	7,783
17	45,231		5,976	97,110	148,317	172,622	24,305
18	32,551		5,976	97,110	135,636	172,622	36,985
19	16,673		5,976	97,110	119,759	172,622	52,863
20	(1,076)		5,976	97,110	102,009	172,622	70,612
21	(11,780)		5,976	97,110	91,305	172,622	81,316
22	(20,502)		5,976	97,110	82,583	172,622	90,038
23	(27,539)		5,976	97,110	75,546	172,622	97,075
24	(28,726)		5,976	97,110	74,360	172,622	98,262
25	(28,726)		5,976	97,110	74,360	172,622	98,262
26	(28,726)		5,976	97,110	74,360	172,622	98,262
27	(28,726)		5,976	97,110	74,360	172,622	98,262
28	(28,726)		5,976	97,110	74,360	172,622	98,262
29	(28,726)		5,976	97,110	74,360	172,622	98,262
30	(1,689)		5,976	30,223	34,510	172,622	402,124
TOTAL		53,034	158,852				

INTERNAL RATE OF RETURN	21.9 %
NET PRESENT VALUE (12% DISCOUNT)	88,305 L X 1,000
NET PRESENT VALUE (14% DISCOUNT)	52,814 L X 1,000
NET PRESENT VALUE (16% DISCOUNT)	30,417 L X 1,000

Note: On year 30 Net Benefits include the Residual Value of additional forest wood generated by the Project in the Area "La Union" and in Area 2.

Ignoring the Forest Management component, the ERR of the project is: 25.7 %

Source: Tables 9, 10, 15 and 16.

TABLE 18

TAX REVENUES AND EXPENDITURES OF THE GOH

(Thousands of 1985 Lempiras)

Project Year	TAX REVENUES Without Project	With Project	Tax Increase	Additional Expenditure	Net Gain in GOH Income
1	24,275	24,275	0	1,340	(1,340)
2	24,413	24,184	(226)	2,588	(2,816)
3	24,550	24,044	(506)	2,150	(2,656)
4	24,506	23,582	(924)	3,094	(4,018)
5	24,643	23,320	(1,323)	3,256	(4,579)
6	24,781	23,077	(1,703)	3,554	(5,257)
7	24,986	23,619	(1,367)	3,566	(4,933)
8	25,124	24,012	(1,112)	5,550	(6,662)
9	25,261	24,404	(857)	5,550	(6,407)
10	25,286	24,740	(546)	5,550	(6,096)
11	25,286	24,740	(546)	5,550	(6,096)
12	25,286	24,740	(546)	5,550	(6,096)
13	25,286	24,740	(546)	5,550	(6,096)
14	25,286	24,740	(546)	5,550	(6,096)
15	25,286	24,740	(546)	5,550	(6,096)
16	18,221	24,740	6,519	5,550	969
17	12,787	24,740	11,953	5,550	6,403
18	8,258	24,740	16,482	5,550	10,932
19	5,423	24,740	19,317	5,550	13,767
20	4,325	24,740	20,415	5,550	14,865
21	3,501	24,740	21,239	5,550	15,689
22	2,814	24,740	21,925	5,550	16,375
23	2,265	24,740	22,475	5,550	16,925
24	2,265	24,740	22,475	5,550	16,925
25	2,265	24,740	22,475	5,550	16,925
26	2,265	24,740	22,475	5,550	16,925
27	2,265	24,740	22,475	5,550	16,925
28	2,265	24,740	22,475	5,550	16,925
29	2,265	24,740	22,475	5,550	16,925
30	2,265	24,740	22,475	5,550	16,925

Source: Tables 13, 14 and 15.

TABLE 19

FOREIGN EXCHANGE RECEIPTS AND EXPENDITURES

(Thousands of 1985 dollars)

Project Year	PROJECT EXPENDITURE With-Project	PROJECT EXPENDITURE Without-Project	EXPORTS With-Project	EXPORTS Without-Project	Net Gain
1	54,937	54,937	44,268	44,268	0
2	29,488	30,454	44,307	44,307	966
3	29,018	30,739	44,346	44,346	1,722
4	28,172	30,587	43,990	43,990	2,415
5	28,008	31,122	44,029	44,029	3,117
6	27,632	31,406	44,068	44,068	3,775
7	27,611	32,075	44,126	44,126	4,464
8	27,500	32,116	44,165	44,165	4,557
9	27,636	32,402	44,203	44,203	4,766
10	27,659	32,634	43,867	43,867	4,974
11	27,307	32,159	43,867	43,867	4,852
12	27,307	32,159	43,867	43,867	4,852
13	27,307	32,159	43,867	43,867	4,852
14	27,307	32,159	43,867	43,867	4,852
15	27,307	32,159	43,867	43,867	4,852
16	27,307	19,140	43,867	28,466	7,313
17	27,307	14,881	43,867	16,054	14,786
18	27,307	11,963	43,867	6,795	20,728
19	27,307	12,439	43,867	1,592	27,467
20	27,307	13,244	43,867	1,282	34,583
21	27,307	25,398	43,867	969	36,969
22	27,307	26,800	43,867	795	42,565
23	27,307	29,539	43,867	640	45,459
24	27,307	29,892	43,867	640	45,812
25	27,307	29,892	43,867	640	45,812
26	27,307	29,892	43,867	640	45,812
27	27,307	29,892	43,867	640	45,812
28	27,307	29,892	43,867	640	45,812
29	27,307	29,892	43,867	640	45,812
30	4,807	20,272	43,867	640	58,632
TOTAL	831,426	855,299	1,318,715	722,297	620,290

Source: Tables 9 and 10.

TABLE 26

EMPLOYMENT AND ANNUAL LABOR INCOME

Project Year	WITHOUT PROJECT Labor Income (Lx1,000)	WITHOUT PROJECT Employment (jobs)	WITH PROJECT Labor Income (Lx1,000)	WITH PROJECT Employment (jobs)	DIFFERENCE Labor Income (Lx1,000)	DIFFERENCE Employment (jobs)
1	23,540	11,317	25,046	11,368	1,506	51
2	23,771	11,429	26,039	11,325	2,268	(103)
3	24,003	11,540	26,308	11,283	2,305	(257)
4	24,089	11,581	25,261	11,204	1,172	(377)
5	24,320	11,693	24,762	11,157	442	(535)
6	24,552	11,804	24,850	11,115	298	(688)
7	24,906	11,971	24,696	11,121	(209)	(850)
8	25,131	12,082	24,630	11,179	(501)	(903)
9	25,363	12,194	24,771	11,247	(592)	(947)
10	25,565	12,291	24,881	11,300	(683)	(991)
11	25,565	12,291	24,881	11,300	(683)	(991)
12	25,565	12,291	24,881	11,300	(683)	(991)
13	25,565	12,291	24,881	11,300	(683)	(991)
14	25,565	12,291	24,881	11,300	(683)	(991)
15	25,565	12,291	24,881	11,300	(683)	(991)
16	19,877	9,556	24,881	11,300	5,004	1,743
17	15,502	7,453	24,881	11,300	9,379	3,847
18	11,857	5,700	24,881	11,300	13,025	5,599
19	9,150	4,399	24,881	11,300	15,731	6,901
20	7,297	3,508	24,881	11,300	17,584	7,792
21	5,907	2,840	24,881	11,300	18,974	8,460
22	4,749	2,283	24,881	11,300	20,132	9,017
23	3,822	1,838	24,881	11,300	21,059	9,462
24	3,822	1,838	24,881	11,300	21,059	9,462
25	3,822	1,838	24,881	11,300	21,059	9,462
26	3,822	1,838	24,881	11,300	21,059	9,462
27	3,822	1,838	24,881	11,300	21,059	9,462
28	3,822	1,838	24,881	11,300	21,059	9,462
29	3,822	1,838	24,881	11,300	21,059	9,462
30	3,822	1,838	24,881	11,300	21,059	9,462

Source: Tables 1, 2, 4, 5 and 7, besides AID and GOH planned expenditure tables.

TABLE 21

ADDITIONAL GDP ATTRIBUTABLE TO THE PROJECT

(Thousands of 1985 Lempiras)

Project Year	Net Economic Benefits (*)	Additional Investment Costs	A/I and O&M Expenditure	Additional GDP
1	(8,361)	0	6,381	0
2	(10,858)	(370)	12,980	1,752
3	(11,334)	(372)	15,110	3,403
4	(9,262)	(345)	14,548	4,940
5	(1,822)	(404)	8,648	6,420
6	87	(420)	8,186	7,832
7	3,160	(528)	6,537	9,233
8	4,000	(282)	5,976	9,693
9	4,472	(237)	5,976	10,150
10	4,942	(311)	5,976	10,606
11	4,631	0	5,976	10,606
12	4,631	0	5,976	10,606
13	4,631	0	5,976	10,606
14	4,631	0	5,976	10,606
15	4,631	0	5,976	10,606
16	8,228	16,279	5,976	30,482
17	27,273	12,522	5,976	45,771
18	42,101	10,435	5,976	58,512
19	59,679	6,284	5,976	71,938
20	78,788	2,087	5,976	86,851
21	90,493	1,565	5,976	98,035
22	100,076	1,334	5,976	107,356
23	107,793	1,043	5,976	114,812
24	108,836	0	5,976	114,812
25	108,836	0	5,976	114,812
26	108,836	0	5,976	114,812
27	108,836	0	5,976	114,812
28	108,836	0	5,976	114,812
29	108,836	0	5,976	114,812
30	439,602	(37,735)	5,976	407,843
TOTAL	1,605,195	10,455	211,086	1,827,536

Note: * After eliminating replacement from costs.

Source: Tables 5, 10 and 17.

TABLE 2 - A

PROJECTION OF COMMERCIAL PINE FOREST UTILIZATION WITH PROJECT

Project Year	Sawmill Yield	LOGS Delivered to mill	LOGS Lost in Harvest	LOGS Total used	LUMBER Lumber Production	LUMBER Brooms Sticks	LUMBER Total Production	LUMBER Domestic Market	LUMBER Exports
	(BF/m3)	(Thousands of cubic meters)			(Millions of board feet)				
1	191	916	229	1,145	175	12	187	66	121
2	200	885	111	996	177	12	189	68	121
3	209	856	107	964	179	13	192	70	122
4	218	826	103	929	180	13	193	72	121
5	227	802	100	902	182	13	195	74	121
6	236	780	97	877	184	13	197	76	121
7	245	763	95	859	187	13	200	79	121
8	248	762	95	857	189	13	202	81	121
9	251	761	95	856	191	13	204	83	121
10	254	760	95	855	193	14	207	86	121
11	254	760	95	855	193	14	207	86	121
12	254	760	95	855	193	14	207	86	121
13	254	760	95	855	193	14	207	86	121
14	254	760	95	855	193	14	207	86	121
15	254	760	95	855	193	14	207	86	121
16	254	622	78	700	158	11	169	86	83
17	254	622	78	700	158	11	169	86	83
18	254	622	78	700	158	11	169	86	83
19	254	622	78	700	158	11	169	86	83
20	254	622	78	700	158	11	169	86	83
21	254	622	78	700	158	11	169	86	83
22	254	622	78	700	158	11	169	86	83
23	254	622	78	700	158	11	169	86	83
24	254	622	78	700	158	11	169	86	83
25	254	622	78	700	158	11	169	86	83
26	254	622	78	700	158	11	169	86	83
27	254	622	78	700	158	11	169	86	83
28	254	622	78	700	158	11	169	86	83
29	254	622	78	700	158	11	169	86	83
30	254	622	78	700	158	11	169	86	83
TOTAL		21,241	2,770	24,011	3,172	362	5,534	2,475	3,059

Source: RD/AID projections (Ramon Alvarez).

ERR: 20.6 %

23-Apr-87 FORECON.WK1 WGomez/EPA/AID

168

TABLE 2 - B

PROJECTION OF COMMERCIAL PINE FOREST UTILIZATION WITH PROJECT

		LOGS			LUMBER				
Project Year	Sawmill Yield	Delivered to mill	Lost in Harvest	Total used	Lumber Production	Broom Stakes	Total Production	Domestic Market	Exports
	(BF/m3)	(Thousands of cubic meters)				(Millions of board feet)			
1	191	916	229	1,145	175	12	187	66	121
2	196	905	101	1,006	177	12	189	68	121
3	200	895	47	942	179	13	192	70	122
4	205	880	110	990	180	13	193	72	121
5	209	871	109	980	182	13	195	74	121
6	214	862	108	970	184	13	197	76	121
7	218	858	107	965	187	13	200	79	121
8	220	861	108	969	189	13	202	81	121
9	221	864	108	972	191	13	204	83	121
10	223	867	109	976	193	14	207	86	121
11	223	867	108	976	193	14	207	86	121
12	223	867	108	976	193	14	207	86	121
13	223	867	108	976	193	14	207	86	121
14	223	867	108	976	193	14	207	86	121
15	223	867	108	976	193	14	207	86	121
16	223	701	88	789	156	11	167	86	81
17	223	701	88	789	156	11	167	86	81
18	223	701	88	789	156	11	167	86	81
19	223	701	88	789	156	11	167	86	81
20	223	701	88	789	156	11	167	86	81
21	223	701	88	789	156	11	167	86	81
22	223	701	88	789	156	11	167	86	81
23	223	701	88	789	156	11	167	86	81
24	223	701	88	789	156	11	167	86	81
25	223	701	88	789	156	11	167	86	81
26	223	701	88	789	156	11	167	86	81
27	223	701	88	789	156	11	167	86	81
28	223	701	88	789	156	11	167	86	81
29	223	701	88	789	156	11	167	86	81
30	223	701	88	789	156	11	167	86	81
TOTAL		23,634	2,992	26,626	5,142	360	5,502	2,475	3,027

Source: RD/AID projections (Ramon Alvarez).

ERR: 15.7 %

23-Apr-87 FORECON.WK1 MGomez/EPA/AID

TABLE 6 - B

PRODUCTIVITY COEFFICIENTS OF SAWMILLS WITH-PROJECT

Project Year	Share in Sawnwood: Circular Mills (%)	Share in Sawnwood: Band Mills (%)	Share in Log use: Circular Mills (%)	Share in Log use: Band Mills (%)	Productivity Coefficients (BF/m3): Circular Mills	Productivity Coefficients (BF/m3): Band Mills	Productivity Coefficients (BF/m3): Total
1	40	60	44.94	55.06	170	208	191
2	35	65	39.66	60.34	173	211	196
3	30	70	34.26	65.74	175	213	200
4	25	75	28.76	71.24	178	215	205
5	20	80	23.17	76.83	180	218	209
6	15	85	17.49	82.51	183	220	214
7	10	90	11.73	88.27	186	222	218
8	10	90	11.63	88.37	189	224	220
9	10	90	11.54	88.46	192	225	221
10	10	90	11.45	88.55	194	226	223

Source: RD/AID projections (Ramon Alvarez).

SUMMARY OF PROJECT'S BENEFITS
(Annual Averages)

Calendar Years	Project Years	Net Economic Benefits (Lx1000)	Net Gain in GDP Income (Lx1000)	Net Gain in Foreign Exchange ($x1000)	Additional Labor Income (Lx1000)	Net Employment Increase (jobs)	Net GDP Increase (Lx1000)
1987-1990	1-4	(8,980)	(2,708)	1,276	1,813	(172)	2,524
1991-2000	5-14	6,770	(5,222)	4,506	(398)	(888)	9,636
2001-2010	15-24	56,761	10,675	28,243	14,126	6,129	73,918
2011-2016	25-30	98,262	16,925	47,949	21,059	9,462	114,812

Source: Tables 17, 18, 19, 20 and 21 of Economic Analysis Annex.

Annex H

Forestry Development Project

TECHNICAL ANALYSIS

by Henry Tschinkel

1. INTRODUCTION

The Forestry Development Project builds on fifteen years of forest management experience in Honduras. In addition, Honduras can draw on the experience in Mexico and the southern U.S. where pine forest management under similar conditions is well advanced.

Although initially technical personnel was scarce, around 1972 the number of trained foresters started to increase rapidly as the National Forestry School (ESNACIFOR) started to turn out mid-level technicians and AID scholarship recipients started to return to the country. Because the Government of Honduras has made a large investment in training, the country now has more than 150 professional and 400 mid-level foresters.

2. FINANCIAL AND MANAGERIAL STRENGTHENING OF COHDEFOR

This is not the first assistance project to try to improve the internal operations and the finances of COHDEFOR. FAO, CIDA and IDB have had a series of projects over a decade which have provided financial and technical assistance aimed at turning COHDEFOR into a more effective institution. In retrospect it can be said that some of these projects contributed to creating the conditions that have led to COHDEFOR's present financial problems by encouraging the institution to embark on overambitious, often inappropriate investment projects.

The same organizational, managerial and political constraints which plagued those past efforts can be expected to be a threat to the present project if the necessary previsions are not included.

2.1 Stumpage sale and valuation system

Carrying out forest inventories for timber sale purposes is one of the most fundamental tasks of the field forester. Many Honduran foresters are well versed in these techniques. The challenge is of an organizational nature, since it will be necessary to develop a consistent accountable nation-wide program and the political support that this measure will receive both within and outside COHDEFOR.

A more serious technical challenge will be the study to determine the residual value of standing timber under various conditions, the results of which are to be used to propose pricing alternatives and a clear stumpage pricing policy nationwide. No doubt such a proposal will arouse opposition from vested interests. For this reason and for its wide ranging implications such a study must be of the highest, unassailable quality. External technical assistance will be needed to assure the required quality of this study and to propose pricing alternatives.

2.2 Lumber export

During the last year COHDEFOR has decreased its involvement in the export of lumber and has permitted increased participation of the private sector. Legally, COHDEFOR remains as the exporter in accordance to Law Decree 103 but, with the exception of CORFINO, currently all lumber is exported through the private sector with COHDEFOR's role limited to administration and control. It is not expected that this arrangement will change appreciably under the project. However, in order for COHDEFOR to control the amount and quality of private sector exports it must upgrade its knowledge of foreign markets and their operation, improve its system of gathering production and export statistics, tighten quality control, and process export documents more efficiently. It is expected that with the small qualified staff and project assistance proposed, COHDEFOR's marketing department will be able to carry out these tasks, which will be more control oriented, more restricted than the wide responsibilities this department had, but did not fulfill in the past.

The eight private companies presently involved in exports have been in the business for years and neither expect nor need project assistance.

2.3 COHDEFOR operational costs

COHDEFOR has always developed financial analysis, projections of expected revenues and the corresponding budgets. Therefore, technical ability in this area already exists. The problems that COHDEFOR has had in this respect has been the use of inadequate data, overly optimistic production and export figures, and non adherence to the approved budget.

2.4 COHDEFOR functioning efficiently

COHDEFOR already has considerable experience in the preparation of procedural manuals. The firm Arthur Young analyzed the basic structure and created the original procedure guidelines. For several years a Systems and Operations Unit used to carry out the role of insuring implementation and updating the manuals, but the section was later eliminated. Technical assistance will be contracted to assist in improving personnel management, accounting, communications and general operating procedures and up-dating the existing manuals. The problem has always been and will continue to be the correct implementation of the procedures that are adopted.

As COHDEFOR's gives up its role in marketing and in production, and concentrates on management of the forest resource, its structure and operations will be simplified. A recent study by a FAO adviser is already resulting in some restructuring and decentralization aimed at more emphasis of forest management.

3. FOREST MANAGEMENT OF SELECTED AREAS

COHDEFOR has made numerous attempts to manage the pine forests of specific areas, with various degrees of intensity. Among the most intensive and technically well founded efforts were those in Las Lajas. The experience in Las Lajas was later applied to other Forest Management Units in the Comayagua Forest District. More extensive management is being carried out in some of the Olancho Management Units being logged by CORFINO (San Estéban, Gualaco). Practically all of the techniques proposed for the present project have, to a degree, been applied in some of these past forest management operations.

A technically rigorous and objective method was used to select La Union as the first project target area. As part of Project Paper design the Winrock technical assistance team, through a process of elimination and using concrete criteria, ranked possible working areas in order of priority, suggesting Jocór-La Union. Later COHDEFOR, after field reconnaissance, compiling forest inventory and other background information, decided on the La Union Forest Management Unit. Later studies which culminated in the "Estratégia de Intervención del Area de Manejo La Union, Olancho" confirmed that this had indeed been a proper choice, with excellent prospects for carrying out the intended management.

3.1 Forest management plans

COHDEFOR has produced several good pine forest management plans over the years, usually with external technical assistance. On a small scale plans for pilot management units were prepared in the early 1970's and in 1980 an unusually comprehensive plan was prepared and partially implemented for Las Lajas, with a pine area of 40,000 ha. This plan served as a model for management plans prepared for other forest management units. COHDEFOR's technical staff can draw upon this experience and will only need limited assistance in producing an acceptable management plan for La Union. Plans for the other two areas can then be made later, in part by the same team, without outside assistance.

3.2 Protection of selected areas

The techniques of protecting the pine forests against damage by wildfire and grazing are simple and well known in Honduras. Fire protection using towers and roving guards for detection, local fire brigades and fire breaks for control are all tried, appropriate and cost effective methods. There is no doubt at all that investment in protecting the forest has a very high pay-off. Here also, the obstacles are not technical but rather social. The challenge is in convincing the local population that it is in their interest not to let the forest burn.

Although COHDEFOR has expended considerable effort on forest extension over the years, the results are not evident. One reason for the disappointing impact is probably that the messages have lacked relevant content, appealing to sentiment, patriotism and argueing vaguely that forests should not be burned because of the many good things they provide. Extension under this project must not repeat these mistakes but should emphasize the concrete benefits that local inhabitants can derive from the forest and show them how to do so. Other projects in Honduras have demonstrated that campesinos are very responsive to information which shows them how to produce and earn more. Once they are allowed to profit from the forest, they will see to it that it does not burn.

3.3 Forest road system

COHDEFOR has already constructed forest roads in La Union and has contracted road construction in many parts of the country. Technically these present no problems. In the project road construction will be contracted as part of the timber sale and the cost of the road taken into account when determining the value of the stumpage. The road network will be planned as part of the forest management plan and layout will be done by the COHDEFOR engineer. The difficulty that can be foreseen is the control of the road construction by COHDEFOR to ascertain that specifications are adhered to. Here the chances for intimidation and corruption are obvious. Results could be substandard roads that would be useless soon after the timber is removed and roads that cause excessive environmental damage. COHDEFOR must create an impartial system of outside inspection whose affirmative verdict will be necessary before a road is accepted and the authorization is given so that the timber can be removed.

3.4 Forest regeneration

Successful natural regeneration of the pine forests of Honduras has frequently been demonstrated as long as seed trees are available and the young trees are protected against wildfire and grazing for the first seven to ten years. After that age fire causes little damage and cattle can be grazed under the trees for added income. Leaving marked seed trees is an accepted, low cost practice that should present no major difficulties. However the control of fire and grazing is one of the greatest challenges faced by the project, and by forestry in the pine forests of Honduras in general. There is no quick fix solution. The project follows an appropriate strategy that attacks the problem on several fronts.

Probably the most difficult aspect of the strategy will be to convince farmers and ranchers to intensify management of their cattle and not to indiscriminately burn pastures. It would not be reasonable to try to prevent all fires. The project needs to give assistance in controlled burning to improve the range in those areas where grazing is permitted.

Controlled burning is a low cost, tried tool for range management and with proper precautions such as the season of burning, the construction of fire breaks and continuous vigilance the risk of escaping fires which cause damage to the forest is minimal. Given the deep rooted ranching tradition, the fierce independence of the farmers and ranchers, and the power wielded by some of the large ranchers the transition to more rational range management which is compatible with forest management will require skill, tact and perseverence on the part of COHDEFOR technicians.

Artificial regeneration through plantations and direct seeding is forseen only on a modest scale on areas without seed trees. These techniques are well tried but more expensive than natural regeneration by about an order of magnitude and should be used sparingly. Under local conditions, scarce funds are preferably invested in protection of naturally established seedlings rather than in establishment of small areas of expensive artificial regeneration.

3.4 Local population deriving income from the forest

Several of the income generating activities forseen present few technical difficulties and require no large investments, and for this reason should be initiated first (oxen logging, pit sawing, seed collection, production of railroad ties, resination and wage labor in forest management). A quick impact is needed at the beginning of the project to win the support of the local population and demonstrate that the project is serious. The main difficulty will be to organize and control the groups involved in these money making activities.

However the more promising and lucrative activities such as charcoal production, the utilization of small dimension trees and especially secondary wood industries are technically more challenging and will require intensive technical assistance from the PVO contractor. Some technologies used in other countries but not yet tried in Honduras will have to be tested locally and adapted, one of the primary tasks of the PVO. The feasibility studies that these enterprises require will have to look carefully at the appropriateness of the technologies, at marketing, at the environmental implications and at the long-term availability of the resource. The PVO will have to actively help identify and develop markets as a first step before launching campesino groups in these undertakings. Establishment of the enterprises and support to them during the start-up phase will require intensive assistance, not only in technical matters but also in administrative and organizational affairs, shoals upon which many a campesino enterprise has foundered.

Whatever support is provided can only be temporary. It is imperative that the enterprises quickly get on a sound financial basis, make a profit for their members and make themselves independent of outside assistance. This will be a serious challenge to the groups and the PVO. However, numerous functioning campesino enterprises in Honduras testify to the effectiveness of the profit motive under similar conditions.

3.5 Improved agriculture and grazing practices

The agricultural and grazing techniques and the delivery system proposed for the project are based on those evolved during more than five years of field experience of the Natural Resources Management Project. It is forseen that technical specialists from that project will also be responsible for assisting these activities in the Forest Development Project. For instance an extension agency will be established in La Union and receive the same attention as the 24 agencies already covered by the NRM Project.

It is not expected that new techniques will be introduced. The aim is to extend simple, appropriate practices that are working elsewhere, after testing and adapting them to local conditions. The main problem will be convincing the recipient to change their traditional system to one that acquires a larger capital investment and closer supervision.

4. STRENGTHENING OF FOREST INDUSTRY

4.1 Better utilization of standing timber

Three forces will tend to move the logging industry toward improved utilization: the new system of sale of timber on the stump, the availability of credit for better equipment and for operations, and the provision of technical assistance. Of these the first is by far the most important factor. However, the Forest Industry Technical Assistance Unit can play an important role in speeding up the process by teaching the use of more efficient logging practices, equipment maintenance and residue use -- three areas in which Honduran loggers are particularly deficient. Most of these techniques are used by some progressive operations in Honduras or under similar conditions in other countries. The practical type of training and on-the-job training forseen by the Technical Assistance Unit is the most effective for this audience. However it is unlikely that the logger will respond to techniques that improve utilization of the tree until he pays for the standing tree. Under the disincentive provided by the current system it is utopian to hope for improved utilization.

4.2 Sawmill efficiency

Just as in the case of logging operations, the economic force of higher stumpage costs, combined with credit for sawmills and the availability of technical assistance will gradually force mills toward greater efficiency. For reasons of economy the same Forest Industry Technical Assistance Unit will be used to teach the practices that most urgently need improvement in Honduras: sawmill maintenance, wood drying, lumber handling and mill residue utilization. This assistance will be focussed on the approximately 50 sawmill which have been classified as the most promising, because of the excessive number of small, inefficient mills in Honduras. In addition, those industries receiving project credit will

also have access to the technical assistance that will be part if the credit package, thus improving chances for proper utilization of the credit.

This Technical Assistance Unit will require an agressive and mobile approach, taking its services to the forest and the mills and not limiting itself to teaching courses. It will not be easy for such a COHDEFOR unit to win the respect of the loggers and sawmillers after a decade of animosity and disappointments. Therefore the superb quality of this team and adequate resources are prerequisites to its success.

4.3 Financing for greater efficiency of industry

The credit delivery mechanism should be operated through FIDE (Fundación de Investigación y Desarrollo Empresarial) because this institution has already proven effective for channeling credit to secondary forest industry. A survey has shown that credit demand far surpasses the amount to be available through the project. However, development of the credit regulations, their negotiation and promotion are likely to be a time consuming process which could delay implementation. To assure adequate and timely processing of the credit requests FIDE's technical staff will probably have to be increased by one or two individuals. Also FIDE's Scope of Work must be enlarged to include the sawmills industry which is producing an export product, but due to the present legal system, does not appear as an exporter.

5. CONCLUSIONS

With the technical and financial aid of many donors, Honduras' Forestry Development Corporation (COHDEFOR) has carried out many projects to improve the management of the country's forest resources. The progress of these efforts has been limited not by lack of technical capacity but by deficiencies in management and lack of political support.

In summary, although the Forestry Development Project is a complicated project with an unusually wide range of activities, the techniques are well tried and appropriate and should not present serious obstacles. The most likely difficulties will be those of an organizational and social nature. Project management would do well to pay especially close and continuous attention to these latter aspects. It is imperative to maintain the flexibility to make readjustments based on project experience.

172

AGENCY FOR INTERNATIONAL DEVELOPMENT
USAID/HONDURAS

FORESTRY DEVELOPMENT PROJECT
TRAINING PLAN

Prepared by:	Linda Lynch International Training Division OICD/USDA December 1986
Reviewed by:	COHDEFOR and AID February 1987
Adjusted According to PP Reviews	Ramón Alvarez, AID July, 1987

TABLE OF CONTENTS

Project Training Plan

Tables I, II, III and IV

Annex I, Forestry Background and Data

Annex II, Resources Used

Annex III, Institutions and Persons Contacted

Attachments:

1. List of Activity and Budget Sheets on Lotus
2. Training and Budget Printouts
3. Scope of Work
4. Note from COHDEFOR's on Future Projects

FORESTRY PROJECT
TRAINING PLAN

SUMMARY:

The Forestry Project will provide $3,671,945 for training as indicated in the attached training plan. Academic training in the U.S. and Costa Rica (CATIE) for COHDEFOR staff is planned for 10 BS degrees, 8 MS degrees, and 2 Ph.D's ($1,078,004). In Honduras the project will provide 3-year scholarships for the training of a total of 30 advanced-level technicians (dasónomos) at ESNACIFOR, at the rate of 10 new recipients per year during the first 5 project years ($468,000). Short-term training in the US in the form of study tours, specially-designed or on-going short courses will be provided for approximately 100 people, from both COHDEFOR and associated private industry, primarily to upgrade current skill levels or to increase knowledge in specific project areas needed to carry out the project ($831,270).

The remainder of project training will be short-term conducted in the form of courses or on-the-job training in Honduras. ESNACIFOR will be the primary administering organization. Approximately 528 person-months will be delivered by ESNACIFOR ($906,953). Other in-country training, to be managed by the TA team, will provide 457 person-months of training ($387,718).

To support ESNACIFOR in the efficient provision of quality training, a full-time local-hire coordinator for training will be selected and assigned to ESNACIFOR, and the capability for production of appropriate training materials will be strengthened through equipment purchases and a possible consultancy ($119,300).

A. RATIONALE:

Although its hiring history has been relatively low (Table 1), COHDEFOR will experience an increased demand for foresters as it implements its reorganization and as it begins the change over to stumpage evaluation and costing. The reorganization implies training of a total 450 dasónomos for placement of a maximum of 250 at a time in local areas of integrated management. This effort further decentralizes the forest service and, not all the employees moved to a local area from a district office will be replaced. For the purpose of defining training absorption capability for this project, the more conservative estimate of 150 new hires over 7 years will be used. It is anticipated that the Forestry Development Project itself will generate the need for an additional 20 foresters to assist in stumpage evaluation activities.

Additional hiring by related government organizations, projects and the private sector is projected at 77 over the next 5 years bringing the total projected hiring to 247. (Table II)

Data for unemployed foresters indicates that there are approximately 56 foresters in Honduras at the Dasónomo or Bachelor's degree level who are currently unemployed. This number includes the 1986 graduating classes of ESNACIFOR and CURLA. For another 6 forestry graduates there is no employment data available. Both the unemployed and 'no data' foresters are considered as potential resources for the project in addition to 132 expected graduates over the next 5 years from ESNACIFOR, CURLA, and those currently in US degree programs. (See Table III and IV).

The preceding data indicates that during the life of the project the expected maximum availability of foresters will be 194 versus a need for 247. Therefore, a deficit of 53 foresters over the 5 year period would occur if the project undertook no new training.

While FAO reports have projected a much higher need for foresters based upon the forestry resources of the country; project training has been developed using the more conservative estimates of potential new hires and placing the emphasis on strengthening current skills and providing training in areas of specialization critical to project implementation.

B. TRAINING OBJECTIVES:

The training will increase the capability of COHDEFOR staff to carry out expanded responsibilities as a result of the implementation of the new stumpage valuation system and to begin to exercise greater forest management responsibilities. Training will also improve the efficiency of forest industry to prepare it to respond to tightened forestry management procedures. ESNACIFOR, through its administration of the majority of project in-country courses, will extend substantially its capability to deliver in-service training both in Honduras and regionally.

C. PROJECT COMPONENTS:

1. Financial and management strengthening of COHDEFOR (Outputs 1-3)

The project will provide short-term training in both managerial and technical areas to strengthen COHDEFOR's administration of the project and increase technical skills in certain areas. Project support for training at the Dasónomo level is also provided for a total of 30 technicians based on the increased hiring projected by COHDEFOR. Short-term training overseas will be provided in areas not available in country or for observation of relevant forest industry overseas. A different group of graduates from CURLA will continue to attend a specially-designed course in the US annually to upgrade forestry skills. Attendance at the US Forest Service's forest management course is planned for COHDEFOR and private industry officials as well as a course in remote sensing for central COHDEFOR personnel. International seminars in forestry in the US or other countries are also planned to enable COHDEFOR staff to stay current within their fields.

Academic training in the U.S. is planned in forest management, forest engineering, forest mensuration, watershed management, entomology and silviculture. It is planned that more than one person be trained in each area to provide reasonable strength in each area. In all cases, candidates selected for a degree will already hold the preceeding degree. Time is allowed for English language training except in the case of Ph.D participants, who are assumed to have acquired English facility during previous academic work.

a. Short course training in country (362 P/M)

(1) Areas of concentration (technical skills)

(a) Pricing of standing timber, sales procedures
(b) Review of inventory procedures and guidelines (private industry)
(c) Logging operations
(d) Sawmill operations
(e) Bark beetle control
(f) Environmental Protection

(2) Areas of concentration (management skills)

(a) Management and team building
(b) Project planning, analysis and evaluation
(c) Budget planning and development
(d) Data processing
(e) Operating procedures
(f) Adult learning methods (ESNACIFOR)

b. Long-term training in-country, (1080 P/M)

(1) Advanced technician level (Dasónomo)

c. Short-term training overseas: study tours and courses (109 P/M)

(1) Upgrading inventory, timber sales and forest management ski ls, course (CURLA graduates)
(2) Forest management course (COHDEFOR and private industry)
(3) Remote sensing
(4) International seminar in forestry

d. Academic training overseas (504 P/M)

Area of specialization by academic degree:

	B.S.	M.S.	Ph.D
Forest Mgmt., inventory, and sales	4		1
Forest Engineering	2	1	
Forest Mensuration		2	
Watershed Management	1	1	
Entomology	1	1	
Silviculture		1	1

2. Forest Management of selected areas (La Unión, Area 2) (Outputs 4-9)

Training for the forest management area of La Union (and a later-selected second area) draws heavily upon the use of in-country courses and on-the-job training. Extensive training is provided at technician, extensionist, paratechnicians, and campesino levels to achieve project outputs in forest management, environmental management, protection, road systems, forest industries and agroforestry.
Academic training is provided at the BS level for 2 persons each in the areas of range management and agroforestry.

a. Short-course training in country (524 P/M) (TA team, technicians, extensionists, paratechnicians).

(1) Photo interpretation, transfer and map elaboration
(2) Social aspects of project development
(3) Forestry extension activities
(4) Soil conservation, agroforestry, animal health, home economics
(5) Range management
(6) Fire preservation and control
(7) Prescribed burning
(8) Road layout, construction, and maintenance
(9) Enterprise management
(10) Environmental planning and management

b. Academic training overseas (108 P/M)

(1)	Range management	2 BS
(2)	Agroforestry	2 MS

3. Strengthening of Forest Industry (Outputs 10-13).

Training is planned both in country and overseas for private forest industry to provide and upgrade the technical skills needed to increase operating efficiency and to support the conversion to stumpage evaluation and costing. Courses will educate private owners and managers regarding new COHDEFOR procedures and train technicians in such technical areas as logging, equipment maintenance, sawmilling, lumber drying and environmental protection.

In addition, opportunity is provided through some courses for dialog between private industry and COHDEFOR employees.

a. Short course training in-country (98 P/M)

(1) Circular sawmill maintenance (Private Industry)
(2) Logging and bucking techniques (Private Industry)
(3) Lumber drying (Private Industry)
(4) Lumber utilization and management techniques for increased recovery (Private Industry, also COHDEFOR)
(5) Accounting (Private Industry)
(6) Environmental Assessment and Impact Mitigation

b. Short term training overseas, study tours 36 P/M

(1) Sawmill maintenance and operation (COHDEFOR)
(2) Equipment maintenance (COHDEFOR)
(3) Lumber drying (COHDEFOR)
(4) Timber harvesting (COHDEFOR)
(5) Forest Industry Operations (COHDEFOR)

D. TRAINING PLAN IMPLEMENTATION

ESNACIFOR will be the primary organization responsible for the coordination, development, presentation and evaluation of technical courses in Honduras. The existing staff of 1 Ph.D, 1 MS, and 9 BS level instructors will be supplemented by consultants, either Honduran or US as appropriate when ESNACIFOR requires outside expertise. To the extent possible, all consultants will leave ESNACIFOR with the capability to continue the presentation of courses which are done initially with the assistance of consultants. This will include involving ESNACIFOR instructors in course design, content, methods and materials. In addition, ESNACIFOR staff will participate in a course on adult learning and participatory techniques to increase their effectiveness in conducting short-term non-academic courses.

A training coordinator employed by the project and based at ESNACIFOR will coordinate the scheduling, presentation and administrative support necessary. The coordinator will work closely with the ESNACIFOR Director and under the general guidance of the Project Team Leader. The remaining training activities will be handled through other mechanisms. For example, courses in project management and evaluation as well as management training for senior and mid-level COHDEFOR managers will be conducted by US or Honduran consultants and contracted by the project management team, as will those courses applying only to the Central COHDEFOR office, such as data processing.

Responsibility for training activities associated with the implementation of enterprise development and management will be primarily with the PVO implementing this component. They will involve ESNACIFOR as appropriate.

E. ADMINISTRATIVE SUPPORT OF TRAINING ACTIVITIES AT ESNACIFOR

To provide ESNACIFOR with the administrative support needed to carry out the increased workload effectively and efficiently, the project will purchase the following items to be used at ESNACIFOR:

2 Word processors (compatible with AID's WANG's)
1 Letter quality printer
1 Movie projector
1 Slide projector
- Cartons of flip chart papers
- Markers
- Funds for materials such as rotafolios
- Photocopier with autofeed and collator
- Photo interpretation equipment
- Surveying equipment

F. TRAINING BUDGET

Short Term:	
In Honduras at ESNACIFOR	$ 906,953.00
In Honduras - non ESNACIFOR	387,718.00
Outside of Honduras	831,270.00
Long Term:	
In Honduras at ESNACIFOR	468,000.00
Outside of Honduras	1,078,004.00
Training Support to ESNACIFOR ($1,860/month x 48 months)	89,300.00
(Training Coordinator $21,000/year/4)	119,300.00
(Equipment and Supplies $30,000.00)	
Reserve Training Funds	200,000.00
TOTAL TRAINING BUDGET	$3,791,245.00

TABLE I

COHDEFOR ACTUAL NEW HIRES 81-86

	1981	1982	1983	1984	1985	1986
Dasónomos	31	38	17	8	2	10
Ing. Forestales/BS	10	1	6	2	0	2

TABLE II

PROJECTED SOURCES OF EMPLOYMENT IN FORESTRY FOR DASONOMO OR ABOVE

	1987 - 1991
COHDEFOR	
Proyecto AMI	150
Stumpage Evaluation System	20
CIDA	12
Recursos Naturales	5
ENEE-SANAA (El Cajón Project)	10
LUPE Project	40
Private Sector (timber stand analysis)	10
	247

TABLE III

CURRENT AND POTENTIAL AVAILABILITY OF FORESTERS

	UEMPLOYED (Including Class of '86)	NO DATA	PROJECTED GRADUATES 87-91			TOTAL
			ESNACIFOR	CURLA	US UNIV.	
Dasónomos	29	4	78			111
IF/BS	27	2		35	13	77
M.S.					6	6
Total Availability	56	6	78	35	19	194

TABLE IV

CURRENT EMPLOYMENT OF FORESTERS

DEGREE	FORESTRY RELATED EMPLOYMENT				OTHER EMPLOY.	UNEMPLOY.	NO DATA	TOTAL
	COHDEFOR ESNACIFOR	OTHER GOH AGENCIES	CURLA UNAH	FORESTRY INDUSTRY				
Peritos	22	5		12	10	5		54
Dasónomo/BF	148	26	1	5	27	29	4	240
BS/IF	51	22	23	14	10	27	2	149
M.S.	10	3	6	3	3			25
Ph.D			1					2
	232	17	31	34	50	61	6	470

ANNEX I

FORESTRY BACKGROUND* AND DATA

Since the late 1960's, the goverment of Honduras and several donors, primarily AID, FAO, and CIDA have made substantial investments in the training of Honduran technicians and professionals. AID began providing BS level scholarships to the US at about the same time that the National Forestry Science School (ESNACIFOR) was created in Honduras with help from FAO. By 1972, there was already small nucleus of foresters working with the Honduran government to implement better forestry control and management techniques.

ESNACIFOR:
Established in 1969 as a school for forest guards, ESNACIFOR has progressively raised its entrance requirements, improved its curriculum and elevated the status of its graduates. In 1972 it enrolled its first candidates for the 2-year forest technician (Perito Forestal) program and since 1974 has granted the degree of Dasónomo (advanced forest technician) upon successful completion of the current 3-year curriculum. (Yavorsky, Development of Forestry Education in Honduras, 1983). A Dasónomo can obtain a BS in Forestry in the US in less than 2 years. ESNACIFOR also provides in-service training to forestry sector personnel through short courses conducted at Siguatepeque or in other Central American countries.

ESNACIFOR has a faculty of 28 full-time and 3 part-time instructors. The staff includes 1 Ph.D., 1 MS, 9 ingenieros (BS level). Complete facilities exist for housing and instruction for over 200 students.

ESNACIFOR is also heavily involved in research, production and extension actitivies. In 1975, ESNACIFOR, with assistance from the British Overseas Development Adminitration, established a Seed Bank to produce seeds, principally pine, for domestic supply and export. The Seed Bank generates the equivalent of a half of the school's budget.

CURLA:
CURLA, the National Autonomous University Campus at La Ceiba, grants the degree of Ingeniero Forestal (the equivalent to a BS degree) upon completion of its 5-year forestry program. The first group of foresters graduated in 1974. The faculty now consist of 23 professors and 6 foresters who function as graduate assistants. (Winrock, Employment of Foresters in Honduras, September, 1984).

Despite the fact that CURLA graduates BS level foresters, ESNACIFOR graduates are generally considered to have a more solid grounding in forestry principals and practices, due in part to the heavily applied approach of their training.

*Drawn primarily from existing project documents.

The recent and projected graduating classes are indicated in the following tables:

ACTUAL FORESTRY GRADUATES-FORESTRY PROGRAMS IN HONDURAS

	'81	'82	'83	'84	'85	'86
ESNACIFOR	66	18	29	14	9	14
*CURLA	11	11	12	11	11	14

Source: ESNACIFOR and CURLA

* Figures for 81-85. Based on average of 56 total graduates 81-85 fully completing program including thesis.

PROJECTED FORESTRY GRADUATES-FORESTRY PROGRAMS IN HONDURAS

	'87	'88	'89	'90	'91	TOTAL
ESNACIFOR (Dasónomos)	13	20	15	15	15	78
CURLA Ingenieros Forestales)	7	7	7	7	7	35

Source: ESNACIFOR Director
CURLA Director of Forestry Program

AID SPONSORED TRAINING:

AID has academic training in progress as summarized in the following table:

AID-SPONSORED ACADEMIC TRAINING IN PROGRESS*

	COMPLETION DATE		TOTAL
	88	89	
B.S.	2	11	13
			6
			19

*CAPS program and Natural Resources Management Project

AID has also provided the following short-term training during the past two years:

AID-SPONSORED SHORT-TERM TRAINING 01/85 - 10/86

AREA	PARTICIPANTS	MONTHS	P/M
Forest Management	10	2.25	22.50
Tropical Forestry	1	.25	.25
Forestry Administration	2	1.00	2.00
Reforestation	1	.75	.75
Fire Management	6	1.00	6.00
Forest Resource Management	1	1.00	1.00
Executive Management	1	1.00	1.00
Forest Industry Management	1	.50	.50
TOTAL			34.00

For purposes of project planning, the students in the long-term AID training programs were included as working in their sponsoring organizations.

ANNEX II

RESOURCES USED

1. Bucarey J.R.E., Enseñanza Forestal en el Istmo Centroamericano, Part I, FAO, Junio 1976.

2. Ortuño y Medina, Francisco, Analisis Funcional de la COHDEFOR, Septiembre 1986 (Borrador).

3. Pietre, Rafael y Paz Ardón, Raul, Informe Evaluación de la Escuela Nacional de Ciencias Forestales, AID, Noviembre 1986.

4. Tschinkel, Henry, Especialistas Forestales en Centroamérica, 1986.

5. Winrock International, Employment of Foresters in Honduras, Sept. 1984.

6. Yavorski, J.M., Development of Forestry Education in Honduras, Sept. 1983.

7. Project Documents including:

   - Project Identification Document, Forestry Development Project, February, 1984.

   - Pietre, Rafael, Background of Forestry Training, 1986 (draft).

   - COHDEFOR personal and Henry Tschinkel, Estrategia de Intervención del Area de Manejo La Unión, Noviembre, 1986.

8. Up-dated Forestry Employment Printouts prepared by Linda Lynch based on Henry Tschinkel's list.

ANNEX III

INSTITUTIONS AND PEOPLE CONTACTED

COHDEFOR:

- Ing. Jorge Fú Peñalba, Gerente del Departamento de Bosques (Forestry Department Manager)
- Ing. Mateo Molina, Jefe Sección de Manejo Forestal (Forest Management Section Chief)

MINISTRY OF NATURAL RESOURCES:

- Ing. Carlos Rivas, Jefe del Proyecto Manejo de Recursos Naturales (Chief AID Natural Resources Management Project).
- Ing. Manuel Hernandez - Asesor Forestal, (Forestry Advisor).

ESNACIFOR:

- Dr. Rubén Guevara, Director ESNACIFOR (ESNACIFOR's Director)
- Ing. Danilo Escoto, Jefe Depto. de Bosques (Forestry Department Chief)
- Lic. Armando Valle, Profesor (Professor)
- Ing. Miguel A. Mejia, Profesor (Professor)

AID/Regional Office for Central American Programs

- Dr. Henry Tschinkel, Regional Forestry Advisor

AID Mission/Honduras:

- Ing. Ramón Alvarez, Forestry Advisor
- Dr. John Warren, Project Officer (USDA PASA) Natural Resources
- Dr. Rafael Pietre, Education Advisor

ATTACHMENT 1

LIST OF ACTIVITY AND BUDGET SHEETS ON LOTUS

1. All training by output, no budget
2. Academic Training - outside of Honduras and
   Academic Training - in Honduras
3. Non-academic Training in Honduras at ESNACIFOR
4. Non-academic Training in Honduras, non ESNACIFOR
5. Non-Academic Training outside of Honduras
6. Total Training Cost
7. ESNACIFOR Course Costs

7. ESNACIFOR COURSE COST FOR 15 PARTICIPANTS (BUDGET IN DOLLARS)

	One Week Course	Two Week Course
Lodging	338	676
Meals	555	1110
Teaching Materials	300	600
Transportation	300	600
Health Service	225	450
Misc	125	250
Building use	120	240
Administration	265	265
TOTAL	2228	4191
ESNACIFOR Instructor 1	750	1500
Preparation/Followup	1500	2250
ESNACIFOR Instructor 2	750	1500
Preparation/Followup	1500	2250
Honduran Consultant	1000	2000
Preparation/Followup	2000	3000
Per diem @ 30/day	630	1050
US Consultant	1500	3000
Preparation/Followup	3000	4500
P.D. 28 104, 198 45	1063	1828
Travel	600	600
Total Course with 2 ESN inst's.	6728	11691
Total Course with 1 ESN inst, 1 Hond.	8108	13991
+ Total 3 day course with 2 ESNACIFOR instructors =	3364.	
Total Course with 1 ESN inst. 1 US Cons.	10641	17869

ATTACHMENT 3

STATEMENT OF WORK

BACKGROUND

To develop the training component of the Forestry Development Project Paper.

A. SCOPE OF WORK

The specialist will prepare a report that will include:

1. a summary indicating the amount and type of forestry professionals in Honduras;

2. the working status of the forestry professionals in Honduras and their average salary levels;

3. a projection of the future availability of foresters;

4. an analysis of Honduras present and future demand of forestry professionals;

5. a training program for the Forestry Development Project that will include all the training needs indicated by the other project annexes;

6. an implementation plan for the training;

7. a budget indicating the costs per year of the implementation plan; and

8. a summary of the beneficiaries of the training component.

B. METHODOLOGY

The contractor will review documents relating to forestry training in Honduras and the drafts of the other annexes of the Forestry Development Project Paper. All documents will be made available to the specialist. The report will require that the specialist visit the forestry schools, [illegible] and conduct interviews with [illegible] personnel.

C. REPORT

One draft in English of a report which covers the contractor's findings will be submitted December 10th. The draft will be reviewed with the forestry specialist of the Office of Rural Development on December 14th.

A final report will be submitted on December 14th.

cos. 0.191, ; 26-27

ATTACHMENT 4

Dirección Cablegráfica
"COHDEFOR
TELEX
321-1172 COHDEFOR HT

Apartado Postal 1378
Tels.: 22-7050, 22-6052
22-8491, 22-4346, 22-1027

Corporación Hondureña de Desarrollo Forestal

Tegucigalpa D. C. Honduras C. A.

GG- 510/86

Diciembre 16, 1986

Ingeniero
Ramón Alvarez
Programa Desarrollo Rural
Agencia Internacional para el
Desarrollo (AID)
Presente

Estimado Ingeniero Alvarez:

En esta oportunidad deseo ratificarle que la Corporación mantiene interés en que el Proyecto COHDEFOR/AID contemple un componente de capacitación.

Lo anterior lo vemos como una necesidad, en vista que en los planes para el período 1986-1990 prevemos el desarrollo de varios programas y actividades que demandarán de personal técnico así:

- Implementación de un total de 450 áreas de manejo integrado (AMIS)
- Ejecución del Proyecto de Manejo del bosque Latifoliado
- Proyectos de Manejo en las Cuencas Hidrográficas más importantes (El Cajón, Los Laureles, Lago de Yojoa, El Higuero, etc.)
- Proyecto de Carbonización a desarrollar en unas 50 comunidades
- Ejecución del Proyecto COHDEFOR/AID en un área de unas 100 mil hectáreas en el sector de La Unión, Olancho.
- Participación en varios Proyectos de Desarrollo Integrado (DRI-Yoro, DRI -- Choluteca, La Paz, Intibucá entre otros).

Como comprenderá, para el exitoso desarrollo de tal planificación exige la conformación de cuadros técnicos bien capacitados en diferentes disciplinas que permitan asegurar el éxito correspondiente.

Sin otro particular, es grato saludarlo

Atentamente,

ING. JOSE SEGOVIA INESTROZA
Gerente General

cc: Planificación
cc: [illegible]
cc: [illegible]

ATTACHMENT 2

FORESTRY DEVELOPMENT PROJECT (522-0246)

1. ALL TRAINING BY PROJECT OUTPUT

Proj. Output	Type of Training	Part's ea course	Content	Duration Months	Level of Responsibility/Position	No. of Courses	Provider	Year Training Begins Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	P/M
1	B.S.	4	Forest Mgmt:inventory, sales, 2mos.FS	32	Forestry Technicians		U.S. universities	1	1	1	1				120
1	M.S.	2	Forest Mensuration, 2mos. FS	32	B.S. level technicians		U.S. universities		1			1			4
1	in-c course	20	Classification of Pine Forests in Hondur.	0.25	District & Unit pers., EBMACIFOR, CURLA, Zacorano staf	1	EBMACIFOR/Consultant	1							3
1	in-c course	15	Pricing of standing timber, sales proc.	0.5	Private forestry sector owners, ppr. techs	3	EBMACIFOR			3					23
1	in-c course	15	Pricing of standing timber, sales proced	0.5	District Mgmt personnel, COHDEFOR	5	TA/EBMACIFOR		3						23
1	in-c course	15	Inventory, preparation of tract for sale	1	District Mgmt personnel, tech's	8	TA/EBMACIFOR	2	2	2	2				121
1	in-c course	15	Review inventory procedures, guidelines	0.15	Private forestry sector owners and managers	3	TA team	2	1						7
1	overseas course	10	Upgrade inv, timber sales, first mgmt skills	2	Forest technicians	5	U.S. university	1	1	1	1	1			110
1	in-c course	15	Environment assess. & impact mitig.	0.5	COHDEFOR personnel	1	EBMACIFOR/U.S.Cons	1							6
1	in-c course	15	Principles-environmental planning & mgt.	0.15	COHDEFOR technicians, community leaders	3	TA/EBMACIFOR	1		1		1			4
1	in-c course	15	Environment guidelines-forestry harvest	0.25	Private forestry sector, lumberman	3	TA/EBMACIFOR		1		1		1		11
3	Dasonomo	30	Forestry	36	Bachelor (M.S.) graduates in forestry		EBMACIFOR	5	6	6	6	5			1020
3	B.S.	2	Forest Engineering, 2mos. FS	32	Dasonomo level technicians		U.S. university		1			1			14
3	B.S.	1	Entomology, 2mos. FS	32	Dasonomo level technician		U.S. university			1					11
3	B.S.	1	Watershed Management	30	Dasonomo level technicians		U.S. university		1						14
3	M.S.	1	Watershed Management	30	B.S. level technicians		U.S. university		1						20
3	M.S.	1	Forest Engineering, 2mos. FS	32	B.S. level technician		U.S. university		1						32
3	M.S.	1	Silviculture, 2mos. FS	32	B.S. level technicians		U.S. university		1						11
3	M.S.	1	Entomology, 2mos. FS	32	B.S. level technician		U.S. university			1					11
3	Ph.D	1	Forest Management, Exp. Research Design	30	M.S. level technician		U.S. university		1						12
3	Ph.D	1	Silviculture	30	M.S. level technician		U.S. university			1					12
3	in-c course	10	Lumber grading	0.5	COHDEFOR Mktg & Quality Control Pers.	3	Honduran consultants		1	1	1				15
3	in-c course	10	Operating procedures	0.15	COHDEFOR Personnel	16	TA/EBMACIFOR	3	3	3	3	2	2		14
3	in-c course	15	Adult learning & participatory methods	0.5	EBMACIFOR instructors	1	U.S. consultants	1							3
3	in-c course	4	Data processing	0.25	COHDEFOR data processors	9	Honduran computer co	3	3	3					3
3	in-c course	15	Management Techniques for Mid-level Mgrs.	0.5	Central COHDEFOR, district mgmt personnel	8	U.S. consultants	1	2		2	1			45
3	in-c course	15	Computer use for decisionmaking	0.15	COHDEFOR Central managers, District Mgrs.	3	Honduran computer co	3							7
3	in-c course	15	Bark beetle control	0.25	District technicians, beg. w/ La Unid	3	EBMACIFOR/U.S.Cons.		1	1	1				11
3	in-c course	10	Management & Team bldg for Sr. Mgmt	0.25	Central COHDEFOR executives	2	U.S. consultants	1			1				5
3	in-c course	8	Planning, analysis, evaluation of projects	1	Central COHDEFOR, TA team	1	U.S. Consultants	1							3
3	in-c course	11	Budget planning and development	0.25	COHDEFOR Central managers, District Mgrs.	3	Honduran consultant	1	1		1				11
3	overseas course	1	Forest Management	1	COHDEFOR, Private Indust.Mgrs.	7	Michigan MSU	1	1	1	1	1	1	1	7
3	overseas course	2	Resale Pricing	1	Central COHDEFOR technicians, Depto. Bosques	1	U.S/other countries	1							2

07-Jul-87 Directory C:\FDHEDF Dates TOTAL.WK3

FORESTRY DEVELOPMENT PROJECT (522-0246)

ALL TRAINING BY PROJECT OUTPUT

Proj. Output	Type of Training	Part'c per course	Content	Duration Months	Level of Responsibility/Position	No. of Courses	Provider	Year Training Begins Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	P/N
4	in-c course	15	Photo-interpretation, transfer, and elabor	0.5	Forestry Technicians	4	TA/ECHACIFOR	2	2						24
4	in-c course	15	Social aspects of project development	0.25	TA team, forest tech's, extensionists	4	ECHACIFOR/Consultant	1	1	1	1				15
5	in-c course	10	Forestry extension activities	0.5	Forest Ext's, La Union; 2nd area	2	TA/ECHACIFOR/AHRA	1					1		10
5	in-c course	10	Forestry Extension Act's Followup	0.5	Forest Ext's, La Union, 2nd area	12	TA/ECHACIFOR/AHRA		2	2	2	2	2	2	60
5	in-c course	15	Fire prevention and control	0.25	District technicians, beg. w/ La Union	5	ECHACIFOR		1	1	1	1	1		19
5	in-c course	15	Prescribed burning	0.25	District technicians, beg. w/ La Union	5	ECHACIFOR		1	1	1	1	1		19
5	o-j-t	12	Fire prevention and control	0.15	Campesinos	28	Extensionists	4	4	4	4	4	4	4	20
6	in-c course	10	Road layout, contruction & maintenance	0.5	Forest technicians, La Union	3	ECHACIF	1	1	1					15
6	o-j-t	12	Road construction & maintenance	1	Campesinos	6	Extensionists		2	2	2				72
9	B.S.	2	Range management	30	Baccalaureate level technicians		U.S. universities	1			1				60
9	M.S.	2	Agroforestry	24	Forestry Technicians		CATIE			1	1				48
9	in-c course	20	Soil cons, ag for, an.hlth,, hose ec, ...	0.25	Extension agents	22	Nat Res.& Ext. team	2	4	4	4	4	4		110
9	in-c course	20	Soil cons, ag for, an.hlth,, hose ec, ext	0.25	Paratechnicians	22	Extension agents	2	4	4	4	4	4		110
9	in-c course	15	Range management	0.5	Forest technicians, La Union	1	ECHACIFOR/consult.								8
9	o-j-t	12	Range management techniques	0.15	Ganaderos, campesinos, La Union	4	ECHACIFOR/tech's		1	2	1				7
10	in-c course	15	Logging and bucking techniques, I or II	0.15	Loggers and foreman	7	ECHACIFOR	1	1	2	2				16
10	study tour	1	Timber harvesting	3	COHDEFOR's technical assistance unit	2	U.S/other countries		1	1					6
12	in-c course	15	Circular sawmill maintenance, I or II	0.15	Sawmill [illegible] and mechanics	12	ECHACIFOR	2	2	2	2	2	1	1	27
12	in-c course	10	Accounting	0.25	Sawmill accountants	3	ECHACIFOR		1	1	1				6
12	in-c course	15	Circular sawmill maintenance	0.25	Sawmill managers and owners, 2 from COHDEFOR	8	ECHACIFOR		2	2	2				20
12	in-c course	15	Timber utiliz & agst tech for incr recov	0.15	Sawmill mgrs & owners & COHDEFOR	5	ECHACIFOR	1	1	1	1	1			11
12	in-c course	15	Lumber drying	0.15	Lumber yard supervisors, foremen	6	ECHACIFOR		2	2	2				14
12	study tour	8	Forest industry operations,inc Fair	0.5	Med-size sawmill owners, COHDEFOR	3	U.S. Forest Indust.		4	1	1				12
12	study tour	1	Eng. maintenance	3	COHDEFOR's technical assistance unit	2	U.S/other countries		1	1					6
12	study tour	1	Sawmill maintenance & operation	3	COHDEFOR's technical assistance unit	2	U.S/other countries		1	1					6
12	study tour	1	Drying of Lumber	3	COHDEFOR's technical assistance unit	2	U.S/other countries		1	1					6
														TOTAL	2002

123

FORESTRY DEVELOPMENT PROJECT (522-0246)

ACADEMIC TRAINING - OUTSIDE [illegible]NDURAS

Proj. Output	Type of Training	Part's	Content	Duration Months	Level of Responsibility/ Position	Provider	Yr1 Cost Act US$	Yr2 Cost Act US$	Yr3 Cost Act US$	Yr4 Cost Act US$	Yr5 Cost Act US$	Yr6 Cost Act US$	Yr7 Cost Act US$	Total US$	P.M.
1	B.S.	4	Forest Mgt.inventory, sales, Tras.FS	32	Forestry Technicians	U.S. universities	1 22000	1 44000	1 50667	1 50667	36667	14667		[illegible]	[illegible]
1	M.S.	2	Forest Mensuration, 2aos. FS	32	B.S. level technicians	U.S. universities		1 22000	22000	14667	1 22000	22000	14667	117334	64
3	B.S.	2	Forest Engineering, 2aos. FS	32	Bachelor level technicians	U.S. university		1 22000	22000	14667	1 22000	22000	14667	117334	64
3	B.S.	1	Entomology, 2aos. FS	32	Bachelor level technician	U.S. university			1 22000	22000	14667			[illegible]	32
3	B.S.	1	Watershed Management	30	Bachelor level technicians	U.S. university		1 22000	22000	11000				[illegible]	30
	M.S.	1	[illegible] Management	30	B.S. level technicians	U.S. university		1 22000	22000	11000				[illegible]	30
	M.S.	1	Silviculture, 2aos. FS	32	B.S. level technicians	U.S. university		1 22000	22000	14667				[illegible]	32
3	M.S.	1	Forest Engineering, 2aos. FS	32	B.S. level technician	U.S. university		1 22000	[illegible]	[illegible]				[illegible]	32
3	M.S.	1	Entomology, [illegible] FS	32	B.S. level technician	U.S. university			1 22000	[illegible]	14667			[illegible]	32
3	Ph.D	1	Silv[illegible]	30	M.S. level technician	U.S. university			1 22000	[illegible]	11000			[illegible]	30
3	Ph.D	1	Forest Mgt., emphasis research design	30	M.S. level technician	U.S. university		1 22000	22000	11000				[illegible]	30
SUBTOTAL REORIENTATION OF COMIFOR							1 22000	6 132000	4 278667	1 216335	2 [illegible]	0 58667	0 29334	934004	504
9	B.S.	2	Range management	30	Bachelor level technicians	U.S. universities	1 22000	22000	[illegible]	1 22000	22000	11000		[illegible]	60
9	M.S.	2	Agroforestry	[illegible]	Forestry Technicians	CATIE			1 110.0	1 [illegible]	[illegible]			[illegible]	48
SUBTOTAL FOREST MANAGEMENT OF SELECTED AREAS							1 22000	0 [illegible]	1 [illegible]	2 [illegible]	0 [illegible]	0 [illegible]	0	[illegible]	108
							2	6	5	[illegible]	2	0	0		
TOTAL ACADEMIC TRAINING - OUTSIDE OF HONDURAS							[illegible]	220000	300667	216335	154001	14667	29334	1374004	612

ACADEMIC TRAINING IN HONDURAS

Proj. Output	Type of Training	Part's	Content	Duration Months	Level of Responsibility/ Position	Provider	Yr1 Cost Act US$	Yr2 Cost Act US$	Yr3 Cost Act US$	Yr4 Cost Act US$	Yr5 Cost Act US$	Yr6 Cost Act US$	Yr7 Cost Act US$	Total US$	P.M.
3	Cascaco	30	Forestry	36	Bachelor (B.S.) grads in fo[illegible]	CENAGIFOR	6 [illegible]	6 82400	6 [illegible]	6 [illegible]	6 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
							6	6	6	6	6	0	0		
TOTAL ACADEMIC TRAINING - HONDURAS							[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Kg

FOREST DEVELOPMENT PROJECT (522-0241)

3. NON-ACADEMIC TRAINING IN HONDURAS AT ESNACIFOR

Proj. Part. Output as course	Content	Duration Months	Level of Responsibility/Position	No. of Courses	Provider	Yr1 Cost ACT US$	Yr2 Cost ACT US$	Yr3 Cost ACT US$	Yr4 Cost ACT US$	Yr5 Cost ACT US$	Yr6 Cost ACT US$	Yr7 Cost ACT US$	Total US$	P.M.
													10641	8
1	10 Di[illegible] of Pine Forests in Honduras	0.25	District & Dept pers., ESNACIFOR, CURLA, 2	1	ESNACIFOR/U.S.Cons	1 10641							101716	117
1	15 Inventory, preparation of tract for sale	1	District Mgmt personnel, tech's	2	TA/ESNACIFOR	2 37164	2 37164	2 37164					19457	22
1	15 Pricing of standing timber, sales process	0.5	District Mgmt personnel, CONDEFOR	5	TA/ESNACIFOR		5 19457						35077	43
1	15 Pricing of standing timber, sales process	0.5	Private forestry sector owners, agrs, tech	3	ESNACIFOR			3 35077					17557	7
1	15 Environment assess. & impact mitigation	0.5	CONDEFOR Personnel	1	ESNACIFOR/U.S.Cons	1 17557							16072	7
1	15 Principles-environmental planning & agt.	0.15	ESNACIFOR technicians, community leaders	3	TA/ESNACIFOR	1 3364		1 3364		1 3364			20184	11
1	15 Environment guidelines-forestry, harvest	0.25	Private forestry sector, lumbermen	3	TA/ESNACIFOR		1 6728		1 6728		1 6728		11205	11
3	15 Bark beetle control	0.25	District technicians, beg. w/ La Union	3	ESNACIFOR/U.S.Cons.		1 10641	1 10641	1 10641				31923	29
3	10 Operating procedures	0.15	CONDEFOR Personnel	16	TA/ESNACIFOR	3 10642	3 10642	3 10642	3 10642	2 6728	2 6728		57029	59
SUBTOTAL REFORESTATION & INDUSTRY				24		8 79730	12 130669	13 96934	7 61025	3 10092	3 13456		33 197	249
4	15 Photo-interpretation, transfer, exp plan	0.5	Forestry Technicians	4	TA/ESNACIFOR	2 27732	2 27732						55464	70
4	15 Social aspects of project development	0.25	TA team, forest tech's, extensionists	4	ESNACIFOR/U.S.Cons	1 3360	1 3360	1 3360	1 3360				13440	15
-	15 Fire prevention and control	0.25	District technicians, beg. w/ La Union	5	ESNACIFOR		1 6728	1 6728	1 6728	1 6728	1 6728		33640	7
5	10 Forestry Extension Ext's Fellows	0.5	Forest Ext's, La Union, 2nd area	12	TA/ESNACIFOR/WORLD		2 23282	2 23282	2 23282	2 23282	2 23282	2 23282	[illegible]	[illegible]
5	10 Forestry extension activities	0.5	Forest Ext's, La Union; 2nd area	2	TA/ESNACIFOR/WORLD	1 11691					1 11691		23382	16
5	15 Prescribed burning	0.25	District technicians, beg. w/ La Union	5	ESNACIFOR		1 6728	1 6728	1 6728	1 6728	1 6728		33640	19
6	10 Road [illegible] construction & maintenance	0.5	Forest technicians, La Union	3	ESNACIFOR	1 11691	1 11691	1 11691					35073	12
6	15 Range [illegible]	0.5	Forest technicians, La Union	1	ESNACIFOR/U.S.Cons	1 17009							17009	7
9	12 Range [illegible] techniques	0.15	Ganaderos, campesinos, La Union	4	ESNACIFOR/tech's		1 3364	1 3364	1 3364				10092	7
SUBTOTAL FOREST MANAGEMENT OF ACCEPTED AREAS				41		6 70741	9 [illegible]	8 [illegible]	6 [illegible]	4 [illegible]	5 [illegible]	2 [illegible]	376598	182
10	15 Logging and bucking techniques, I or II	0.15	Loggers and foreman	7	ESNACIFOR	1 3364	2 [illegible]	2 [illegible]	2 [illegible]				[illegible]	15
12	10 Accounting	0.25	Sawmill accountants	3	ESNACIFOR		1 6728	1 6728	1 6728				[illegible]	8
12	15 Circular sawmill maintenance	0.25	Sawmill managers and owners, 2 from CONDEF	6	ESNACIFOR		2 6728	2 6728	2 6728				[illegible]	27
12	15 Circular sawmill maintenance, I or II	0.15	Sawmillers and mechanics	12	ESNACIFOR	2 6728	2 6728	2 6728	2 6728	2 6728	2 3364	2 3364	[illegible]	37
12	15 Lumber drying	0.15	Lumber yard supervisors, foreman	6	ESNACIFOR		2 6728	2 6728	2 6728				[illegible]	14
12	15 Lumber utilization & appl. tech for lumber recov	0.15	Sawmill mgrs & owners & CONDEFOR	7	ESNACIFOR	1 3364	1 3364	1 3364	1 3364	1 3364			[illegible]	
SUBTOTAL STRENGTHENING OF [illegible] INDUSTRY				34		4 13456	16 [illegible]	15 [illegible]	15 [illegible]	3 10092	1 3364	1 3364	[illegible]	98
				18		21	12	23	10					
TOTAL NON-ACADEMIC TRAINING IN HONDURAS AT ESNACIFOR						165927	254067	197302	159539	57032	16749	13748	[illegible]	523

FOREST DEVELOPMENT PROJECT (522-0246)

A. NON-ACADEMIC TRAINING IN HONDURAS - NON CONADIFOR

Proj. Output	Type of Training	Part's Contact	Duration Months	Level of Responsibility/Position	No. of Courses	Provider	Yr1 Cost Act US$	Yr2 Cost Act US$	Yr3 Cost Act US$	Yr4 Cost Act US$	Yr5 Cost Act US$	Yr6 Cost Act US$	Yr7 Cost Act US$	Total US$	P.T.
1	Short Course	17 Develop information, procedures, guidelines	[illegible]	[illegible] Director General and Manager	3	TA team	2 [illegible]	1 [illegible]						[illegible]	7
3	Short Course	18 [illegible] & participatory methods	[illegible]	[illegible]	1	U.S. consultants	1 [illegible]							[illegible]	3
3	Short Course	19 Social forestry and development	[illegible]	Central Managers, District Mgrs.	3	Honduran consultant	1 7500	1 [illegible]		1 7500				[illegible]	11
3	Short Course	11 Computer use for decision making	0.15	CONADIFOR Central managers, District Mgrs.	3	Honduran computer co	2 [illegible]							[illegible]	7
3	Short Course	9 Data processing	0.25	CONADIFOR data processors	9	Honduran computer co	3 4500	3 [illegible]	3 4500					[illegible]	9
3	Short Course	10 Lumber grading	0.5	CO CONFOR Mktg & Quality Control Pers.	3	[illegible] consultants		1 7500	1 7500	1 7500				[illegible]	10
3	Short Course	1[illegible] Planning Cont & Feed Ctrl for [illegible] Mgmt	0.25	Central District executives	2	Dist. consultants	1 [illegible]			1 [illegible]				[illegible]	3
3	Short Course	1[illegible] Technical for Mid-level Mgrs.	1.0	Central District, district mgmt personnel	3	U.S. Consultants	1 [illegible]	2 [illegible]		2 [illegible]	1 [illegible]			[illegible]	4
3	Short Course	[illegible] Planning, Mkt Mktg, Evaluation of proj.	1	Central CONFOR, TA team	1	U.S. Consultants	1 [illegible]							[illegible]	1
SUBTOTAL REGISTRATION OF CONIFOR							12 [illegible]	2 [illegible]	4 [illegible]	2 [illegible]	1 [illegible]	0	0	[illegible]	[illegible]
5	Project	1[illegible] Fire prevention and control	0.12	Technicians	23	Extension agents	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]	[illegible]	[illegible]
6	Project	1[illegible] Tree [illegible] & maintenance	1	Technicians	4	Extension agents		3 [illegible]	2 [illegible]	1 [illegible]				[illegible]	[illegible]
9	Short Course	2[illegible] Cost Data, Bid Ref, Accounts, [illegible] PS, Ext	0.25	Extension agents	20	Nat Resc & Ext. Dept	2 4455	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]		[illegible]	[illegible]
9	Short Course	21 Cost Data, Bid, Ref, Accounts, Nat. Res, Ext	0.25	Paralegal[illegible]	22	Extension agents	2 4455	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]	4 [illegible]		[illegible]	[illegible]
SUBTOTAL FOREST MANAGEMENT OF SELECTED AREAS							8 9455	14 [illegible]	14 [illegible]	14 [illegible]	12 [illegible]	12 [illegible]	4	540	[illegible]
							21	22	18	17	13	12	4		
TOTAL NON ACADEMIC TRAINING IN HONDURAS - NON CONADIFOR							[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]

Best Available Document

5. NON ACADEMIC TRAINING OUTSIDE OF HONDURAS

Proj. Output	Type of Training	Form Participants	Content	Duration Months	Level of Responsibility/Position	Name Courses	Provider	Yr1 Cost Act US$	Yr2 Cost Act US$	Yr3 Cost Act US$	Yr4 Cost Act US$	Yr5 Cost Act US$	Yr6 Cost Act US$	Yr7 Cost Act US$	Total US.	P/M
*	10	Supervisor, timber sales, for. ept skill	2 University and evolved foresters	5	U.S. University			1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]			[illegible]	[illegible]
2	1	Forest Management	1 CONAFOR, Private Industries.	7	Michigan MSU			1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]	1 [illegible]	[illegible]	[illegible]
2	2	Remote sensing	1 Central CONAFOR technicians, Depto. Bosque	1	U.S/other countries			1 [illegible]							[illegible]	[illegible]
SUBTOTAL REFORESTATION								3 [illegible]	2 [illegible]	2 [illegible]	2 [illegible]	2 [illegible]	1 [illegible]	1 [illegible]	[illegible]	[illegible]
10	1	Timber harvesting	3 CONAFOR, technical assistance unit	2	U.S/other countries			1 [illegible]	1 [illegible]						[illegible]	[illegible]
12	2	Forest industry operations, inc Fair	0.5 Peasant sawmill owners, CONAFOR, CONADIFO	3	U.S. Forest Indust.			1 [illegible]	1 [illegible]	1 [illegible]					[illegible]	[illegible]
12	1	Engine maintenance	3 CONAFOR, technical assistance unit	2	U.S/other countries			1 [illegible]	1 [illegible]						[illegible]	[illegible]
12	1	Sawmill maintenance & operat.	2 CONAFOR, technical assistance unit	2	U.S./other countries			1 [illegible]	1 [illegible]						[illegible]	[illegible]
12	1	Drying of timber	3 [illegible] technical assistance unit	2	U.S/other countries			1 [illegible]	1 [illegible]						[illegible]	[illegible]
SUBTOTAL STRENGTHENING OF FOREST INDUSTRY								6 [illegible]	5 [illegible]	1 [illegible]	0 [illegible]	0 [illegible]	1 [illegible]	[illegible]	[illegible]	[illegible]
								9	7	3	2	1	1			
TOTAL NON-ACADEMIC TRAINING OUTSIDE OF HONDURAS								120059	22107	202093	140990	116763	6757	1751	[illegible]	145

* Perdice calculated amount, the use of core facilities and cafeteria at UD University.

Best Available Document

FORESTRY DEVELOPMENT PROJECT (522-0248)

6. TOTAL TRAINING COST

	Yr1 Cost Act US$	Yr2 Cost Act US$	Yr3 Cost Act US$	Yr4 Cost Act US$	Yr5 Cost Act US$	Yr6 Cost Act US$	Yr7Cost Act US$	Total US$	PM
TOTAL ACADEMIC TRAINING - OUTSIDE OF HONDURAS	44000	220000	300667	280335	154001	69667	29334	1078004	612
TOTAL NON-ACADEMIC TRAINING OUTSIDE OF HONDURAS	120250	222390	222390	145990	106750	6250	8750	831270	145
- TRAINING OUTSIDE OF HONDURAS	164250	442390	523057	406325	260751	75917	38084	1909274	757
TOTAL ACADEMIC TRAINING - HONDURAS	31200	62400	93600	93600	93600	62400	31200	468000	[illegible]
TOTAL NON-ACADEMIC TRAINING IN HONDURAS AT ESNACIFOR	186727	244067	197303	158637	57022	16549	26746	903053	[illegible]
TOTAL NON-ACADEMIC TRAINING IN HONDURAS - NON ESNACIFOR	110764	90014	32944	92648	42444	10384	[illegible]	327718	467
SUBTOTAL - TRAINING IN HONDURAS	307691	396481	323847	336787	193066	141313	58492	1762871	[illegible]
G R A N D T O T A L	472141	838871	846904	743112	453817	[illegible]	96576	[illegible]	2282

198

7. ESNACIFOR COURSE COST PER 15 PARTICIPANTS (BUDGET IN DOLLARS)

	One Week Course	Two Week Course
Lodging	138	676
Meals	585	1110
Teaching Materials	300	[illegible]
Transportation	[illegible]	[illegible]
Health Service	220	4[illegible]
Misc	125	1210
Building use	100	2[illegible]
Administration	245	2[illegible]
TOTAL	2028	4[illegible]
ESNACIFOR Instructor 1	750	1500
Preparation /Followup	1500	2250
ESNACIFOR Instructor 2	750	1500
Preparation /Followup	1500	2250
Honduran Consultant	1000	2000
Preparation /Followup	2000	3000
Per diem @ 30/day	630	1050
US Consultant	1500	3000
Preparation /Followup	3000	4500
P.D. 28 104, 198 45	1053	1553
Travel	600	600
Total Course with 2 ESN inst's.	6728	11691
Total Course with 1 ESN inst, 1 Hond.	5108	1399[illegible]
+ Total 3 day course with 2 ESNACIFOR instructors =	3364. +	
Total Course with 1 ESN inst. 1 US Cons.	10841	17[illegible]

Annex J

Análisis Social
Proyecto de Desarrollo Forestal

Por Orlando Hernández, DP

1. Introducción

El propósito de este trabajo es discutir las características demográficas de la región y analizar quienes son los usuarios del bosque y la manera en que actualmente se sirven de él. Esta discusión nos permitira detectar las implicaciones de esas características y esos usos para el Proyecto de Desarrollo Forestal.

2. Características Demográficas: Una Zona de Expulsión de Población

La zona de ejecución del componente de manejo forestal de este proyecto incluye los municipios de El Rosario, Jano, La Unión y Yocón en el Departamento de Olancho. Datos censales indican que se trata de una región que tradicionalmente se ha caracterizado por un lento crecimiento demográfico, baja densidad de población, asentamientos humanos diseminados, y extensas zonas boscosas aun virgenes. En el período 1950-1974, para el cual existen datos censales, la población de la región creció únicamente en (40.3)%. Esto varía enormemente de la tendencia nacional donde con una tasa estimada de crecimiento demográfico de 3.4% se esperararía que la población se duplicara en un período de veinte y seis años. En 1974, la densidad de población en la región era de 8 personas por kilómetro cuadrado, aproximadamente cuatro veces inferior al promedio nacional ese año. Se ha estimado que únicamente 15% de la población vivía en ese momento en pueblos. El resto, 85%, lo hacía en aldeas y caseríos. Por otro lado, a pesar de ser un área de 175,900 has., únicamente una pequeña proporción ha sido tierra en fincas. Eas proporción era de 6.5% en 1952 y 6.4% en 1974. Los datos censales señalan que el tamaño promedio de las fincas ha variado entre años censales. Mientras que una finca promedio tenía 4.5 ha. en 1952, había pasado a tener 7.3 ha. en 1974. Es decir, podría suponerse que ha habido una consolidación de la pequeña propiedad. Tal consolidación, a la luz del bajo crecimiento y densidad demográficos, y de casi una total estabilidad de la cantidad de tierra en fincas, puede dar a suponer que se ha tratado de una región de expulsión de población, de limitada actividad económica donde los que se marchan se deshacen de los predios, vendiendo su derecho a usufructarlos a aquellos que optan por quedarse. La riqueza boscosa de la región no ha probablemente provisto en el pasado fuentes de empleo, y en consecuencia no ha atraído generalmente muchos nuevos pobladores. Las expectativas que pudo haber generado el proyecto de desarrollo de la reserva forestal de Olancho, ejecutado por CORFINO, parecen haber modificado temporalmente esa tendencia. De manera anecdótica, los habitantes de la región relatan los movimientos de población que ha supuesto la red de infraestructura vial que se construyera en la región a partir de (1977) como parte del proyecto forestal mencionado. No obstante, no se ha tratado de un fenómeno de un envergadura tal que haya modificado sustancialmente las tendencias observadas antes hasta 1974. El hecho que ninguna de las organizaciones campesinas del país tengan filiales en la región es indicativo de la ausencia total de presión sobre la tierra que allí existe y de las características demográficas antes mencionadas.

3. Los Usuarios del Bosque

3.1. Principales Grupos Socio-Económicos

El poco atractivo que hasta recientemente ha representado la zona no significa la ausencia de distintos actores que de una forma u otra tienen una relación con el bosque. El bosque constituye punto de convergencia para cultivadores de granos básicos, caficultores, ganaderos y madereros. Los cultivadores de granos básicos se situan en la parte más al sur de la región del proyecto. Se trata de la región menos boscosa y de ladera. El cultivo de granos básicos existe tambien en otros puntos de la región, sobre todo en lugares aledaños a los centros poblados. Los caficultores se situan en la parte más alta de la región, en la zona que los habitantes llaman "montaña". Los ganaderos se encuentran tanto en los pequeños valles como en el bosque de pino. Los madereros explotan, desde recientemente, en pequeña escala tanto el bosque de pino como de latifoliados, aunque hasta ahora parecen haber manifestado mayor interés en el primero que en el segundo. Sobre este punto, vale la pena aclarar que el área del proyecto ha permanecido sin explotaciñon maderera de gran envergadura por muchos años, originalmente debido a la falta de una adecuada vía de acceso, y últimamente debido a que la zona pertenecía a la reserva forestal para el proyecto de CORFINO.

3.2. Mecanismo Generalizado de Aprovechamiento y Apropriación de los Recursos

Los agricultores de la zona manifiestan un interés especial en el bosque de hoja ancha por la calidad del suelo y las condiciones climatológicas que lo caracterizan. Ecológicamente es considerado ideal para el cultivo del café, y se estima que el suelo es adecuado para la siembra de granos básicos, particularmente el frijol. La distancia a la que se encuentra el bosque de hoja ancha lo hace a veces inaccesible, y los agricultores optan por realizar sus cultivos en algunas de las áreas del bosque de pino.

Las áreas virgenes se descombran y se queman siguiendo el método tradicionalmente conocido en Honduras. A pesar de que hay cierto aprovechamiento comercial de la madera tumbada, sobre todo en el caso del bosque de hoja ancha por su valor en el mercado, ese aprovechamiento dista mucho de ser el óptimo. Hay preferencias por ciertas especies. Otras, que aparentemente podrían ser comercializadas, son utilizadas para la construcción de terracería rústica. Por otro lado, el ciclo de uso de la tierra es tal que se siembra la tierra con cultivos anuales o permanentes. Si se siembran cultivos anuales, probablemente haya alguna rotación, para eventualmente dejar la tierra en descanso. La tierra en descanso, conocida como guamil, puede ser usada de nuevo tanto para cultivos permanentes como para cultivos anuales. En ambos casos, la tierra puede ser eventualmente limpiada de nuevo para convertirla a pasto. En pocas palabras, existe un proceso evolutivo en el uso de la tierra donde el bosque, sobre todo el de hoja ancha, pasa a convertirse en pastizal, obligando al agricultor a buscar nuevas áreas de descombramiento. En la medida en que se trata, sin embargo, de una zona de poca densidad demográfica con áreas virgenes, la agricultura migratoria no parecer ser un fenómeno generalizado y desproporcionado. La agricultura migratoria podría convertirse en problema serio si hay un influjo de población atraída por nuevas posibilidades de empleo.

Estas observaciones respecto a la transformación del bosque a pasto via el cultivo anual, el guamil y el cultivo permanente no reflejan un hecho

nuevo. Comparaciones de datos censales para la tierra en fincas correspondientes a 1952 y 1974 señalan que en los municipios que comprende la región del proyecto de un año a otro la proporción de tierra de tierra con bosque se redujo de 11% a 2%, y que la proporción de cultivos permanentes disminuyó de 32% a 24%, mientras que la proporción de tierra destinada a pastos pasó de 9% a 25%. Estas tendencias se observan en casi toda la región, independientemente del municipio.

Datos censales para 1974 señalan que hay una relación lineal entre el tamaño de la finca y el uso que se le da a la tierra. Entre más grande la parcela mayor la cantidad destinada a pastos. En consecuencia, es factible suponer que la conversión del bosque ha tendido a ocurrir en las fincas "pequeñas" y "medianas" y no en los minifundios. Es decir, aquellas cuyos tamaños oscilan entre 10 y 50 has. y entre 50 y 100 has. Se trata, además, de las fincas cuya importancia en número y tamaño han ido en aumento. Es decir, mientras que en 1952 11% de las fincas correspondían a esas categorías de tamaño, en 1974 esa proporción había ascendido a 18%. Por otro lado, el tamaño promedio de las parcelas dentro de la primera categoría había pasado de 17 has. a 18 has., mientras que el tamaño promedio de aquellas en la segunda categoría había aumentado de 67 has. a 76 has.

Basándose en un estudio antropológico que incluían comunidades del Municipio de Yocón, Murray (1981) ha llegado a la conclusión que además del proceso de conversión del bosque a pasto, existe un proceso de traspaso de derechos de usufructo de la finca. A medida que ha habido una reducción en la cantidad de bosques vírgenes de hoja ancha, ha habido un aumento de las transacciones inmobiliarias. Tres de cada doce de los agricultores en las comunidades estudiadas por Murray reportaron haber participado en tales transacciones. Dentro de este sub-grupo, uno había vendido, otro había comprado, y el tercero había vendido y comprado. Los vendedores de sus derechos de usufructo han sido de los más pobres de la aldea, los compradores han sido generalmente los más ricos, mientras que aquellos que venden y compran se situan entre estos dos extremos. Un aspecto importante de tales transacciones es que en alrededor del 50% de los casos, los compradores han sido agricultores que se dedican a la ganadería y que no viven en las aldeas y caseríos de los vendedores. Son ganaderos de los pueblos vecinos que pueden estar ubicados en las partes planas de la región. Para Murray (1981), la importancia que tiene la ganadería en la zona es tal que hay tanto un proceso de remoción de la tierra de la agricultura como un traspaso de derechos de uso a personas ajenas a la comunidad.

3.3. Cultivadores de Granos Básicos

La mayoría de los cultivadores de granos básicos son campesinos individuales que trabajan parcelas cuyo tamaño promedio es de casi 4 has. Cultivan básicamente maíz y frijoles. El acceso al crédito y a la asistencia técnica es limitado. Los pequeños productores de granos básicos han creado un sistema de cooperación mutua para asistirse entre sí en las labores agrícolas que más requieren mano de obra. El sistema de "mano vuelta", como se le llama, ha surgido para compensar la falta de recursos de los agricultores para contratar mano de obra. El Ministerio de Recursos Naturales tiene un extensionista en la zona. No obstante, él es el responsable de asistir a los productores de cuatro municipios donde se estima existen por lo menos 1,500 fincas. En consecuencia, su capacidad de intervención es muy limitada. Datos respecto a los logros del programa de extensión en la región señalan que este extensionista pudo atender apenas 61 productores en el ciclo agrícola 1984/85, y únicamente a 38 en el ciclo agrícola 1985/86. El PTR se encuentra en la zona pero un técnico en

agricultura empleado por el programa debe atender tres municipios. Visión Mundial planifica empezar un programa de capacitación agrícola en la región, habiendo para ello construído un centro de entrenamiento en Salama. Sin embargo, ese programa no empezara a operar sino hasta 1987.

No existen datos actualizados que indiquen los rendimientos agrícolas característicos de la región. Un estudio de campo realizado por Zúniga y Hernández (1976) en algunos municipios ubicados en la región del proyecto señaló que en ese momento se obtenían 20 qq/ha. en el caso del maíz y 6.4 qq/ha. en el caso del frijol. Debido a que datos censales señalan que la cantidad de tierra en descanso ha ido en decremento, lo que puede significar que el período que la tierra agrícola no se cultiva se ha ido reduciendo, es posible que se haya ido observando una pérdida paulatina de productividad. A pesar que este argumento debe quedar planteado únicamente como hipótesis en el caso del maíz, los datos son más concluyentes en el caso del frijol. El Ministerio de Recursos Naturales, a través del Departamento de Investigación Agrícola, ha detectado una disminución de rendimientos en la región debido a tres razones: pérdida de fertilidad de los suelos, sequía y plagas. Se ha empezado a introducir variedades de semilla de resistencia múltiple que puedan ayudarle a los agricultores lograr niveles de productividad más altos. Los ensayos de transferencia de tecnología hasta ahora realizados muestran una apertura por parte de los productores frente a innovaciones tecnológicas agrícolas de bajo costo que repercuten en el ingreso.

Las quemas utilizadas por los pequeños agricultores para preparar la tierra por cultivarse, que en la mayoría de los casos es tierra ya utilizada en ciclos agrícolas previos, son a veces incontroladas, llegando a causar incendios forestales. Sin embargo, el problema no parece ser tan grande como podría suponerse. En el Municipio de La Unión, por ejemplo, en el período 1985-86 de un total de 178 incendios forestales únicamente 3 fueron causados por agricultores que quemando la parcela perdieron el control de la quema. Pedir permiso a COHDEFOR para quemas agrícolas ha empezado a ser práctica común en la región, y algunos agricultores ya hablan de "quemas tecnificadas." A título de ejemplo, en el Municipio de La Unión en los últimos dos años ha habido respectivamente 187 y 188 quemas controladas. En esos casos, COHDEFOR asiste al agricultor en la preparación de las rondas y se establece un día para su realización a fin de poder intervenir en caso de que la quema genere un incendio.

Murray (1981) ha argumentado que en la zona de Yoro y en el Noroeste de Olancho, contrariamente a lo que ha ocurrido y esta ocurriendo con el bosque de latifoliado, que ha ido desapareciendo, el bosque de pino ha podido sobrevivir. A pesar de que no hay cifras catastrales disponibles, en las comunidades donde Murray (1981) hizo su estudio, "la cantidad de bosque de pino parece exceder a la cantidad total de (todos) los otros tipos de tierra (existentes)." El bosque de pino es considerado por muchos pequeños agricultores como un patrimonio colectivo utilizado no únicamente para la extracción de madera para postes, cercos y aun leña, sino que tambien para pastorear el ganado, vacuno y caballar.

Los pequeños agricultores pueden poseer ganado. Datos censales correspondientes a 1974 señalan que 55% de las fincas de menos de 10 has., cuyo tamaño promedio es inferior a 4 has., tenían ganado vacuno. De acuerdo a esos datos, estas fincas reportaron un promedio de 8 cabezas de ganado por

predio. Estos datos son superiores a los encontrados por Murray (1981) en su estudio. Es posible, sin embargo, que las diferencias radiquen en el hecho de haber recopilado información respecto a sub-poblaciones distintas. Es decir, que la sub-población de Murray haya sido compuesta por agricultores más pequeños que aquellos a los que hacemos referencia en base a los datos censales. La información censal señala, además, que en 1974 más de dos terceras partes de los agricultores de los municipios de la región del proyecto poseían caballos o mulas, con un promedio de 2 animales por finca. Murray (1981) señala la importancia del caballo como medio de transporte en la región, particularmente debido a lo aislado de muchas de las comunidades más próximas al bosque de latifoliado. Es decir, el área de mayor actividad agrícola.

Esta información señala la importancia de la ganadería en la región aun para los pequeños productores. De hecho, el estudio realizado por Zúniga y Hernández (1977) indicaba que la segunda fuente de ingreso más común e importante en aquellos municipios de su estudio que coincidían con la región de ejecución del proyecto era la venta de animales, especialmente de ganado. Desde el punto de vista de uso del bosque, no obstante, esta información señala algo de mayor relevancia. El pequeño agricultor no tiene la capacidad de alimentar al ganado vacuno y caballar con los recursos de que dispone en su finca. En consecuencia, debe utilizar una estrategia que supone el uso de distintas fuentes de alimentación de acuerdo a la cantidad de ganado que posee y al período del año de que se trate. La cantidad de tierra en pasto o en guamiles que posee dentro de su finca es muy poca, y aun cuando permita que los animales pasten en el rastrojo que queda después de cosechado el maíz, durante el año, pero especialmente en la época de verano, debe depender de fuentes de alimentación que se encuentran fuera de la finca. Es común que pequeños agricultores compartan con otros zonas de pasto no cercadas que se se encuentran dentro del bosque de pino. Estos lugares, conocidos como "los sitios", tienden a ubicarse en zonas donde el agua es más abundante. No es raro, sin embargo, que los animales deambulen por áreas mayores en busca de alimento. En vista de la cantidad de ganado que podría pastar libremente en el bosque de pino, esto es de particular importancia. Es difícil determinar si habría sobre-pastoreo, pero en todo caso la libertad con que los animales deambulan puede repercutir en la regeneración natural del bosque.

Los reducidos ingresos agrícolas de los productores de granos básicos de la región los obliga a buscar otras fuentes de trabajo. Murray (1981) ha señalado que siete de cada diez hogares investigados dependían de una forma u otra de ingresos por salarios. Aunque la preferencia es trabajar en la comunidad, pueden trasladarse temporalmnte hacia el sur de la región del proyecto donde existen fincas de mayor tamaño que cultivan algodón. Pueden así mismo mobilizarse hacia el norte de la región donde existen fincas de café. Parecen aun existir casos de personas que van más lejos hasta las plantaciones de banano que existen en el Bajo Aguán. Estos empleos, no obstante, son temporales y ocurren generalmente durante la época de recolección de la cosecha. Los agricultores de granos básicos de la región experimentan la necesidad de acceder a nuevas fuentes de ingreso más permanentes y más lucrativas. Las familias más pobres y con los ingresos agrícolas más exiguos preferiran como primera opción trabajo remunerado como obreros, y solo como segunda opción el cultivo de sus propios predios. El proyecto no debera encontrar dificultades en encontrar habitantes

dispuestos a trabajar en labores de aprovechamiento y manejo forestal. Por otro lado, la posibilidad de aprovechar comercialmente el bosque, particularmente a través del proyecto, ha generado tal interés en esta categoría de pobladores que con la asistencia de COHDEFOR se han organizado en pre-cooperativas agro-forestales, esperando obtener su personería jurídica y pasar a la categoría de cooperativas. Actualmente existen cuatro de esos grupos en la zona. Uno de ellos, el de La Unión, ha logrado agrupar a 135 productores.

3.4. Los Caficultores

A pesar de que los datos censales señalan una disminución del área sembrada con cultivos permanentes en favor de un aumento del área con pastos, no se trata del área cultivada con café, sino más bien de aquella sembrada con otro tipo de cultivos permanentes. El área sembrada con café, por el contrario, ha ido en aumento. Mucha de la tierra situada dentro del bosque de latifoliados ha sido convertida a cafetales. El proceso de descombramiento del bosque de latifoliados para el cultivo del café es contínuo debido al valor comercial del producto. El descombramiento de este bosque se realiza tanto por pobladores viejos como por pobladores nuevos. Se ha indicado que muchos de estos últimos son ex-beneficiarios de la reforma agraria que decidieron abandonar los proyectos a los que pertenecían en la zona del Bajo Aguan para trasladarse a la zona Norte de Olancho y este de Yoro para establecer allí su finca. La importancia del café en la zona es tal que únicamente en el Municipio de La Unión la Junta Local de AHPROCAFE tiene inscritos 250 miembros. En ese municipio, el área plantada de café es de aproximadamente 800 has., con un tamaño promedio de finca que oscila entre 3 y 4 has.

La mayor parte de los caficultores han sembrado variedades nacionales y utilizan tecnología rudimentaria para el cultivo del café. Aunque la roya no es un problema de gran magnitud en la zona, parece ya haber hecho su aparición. Son problemas típicos de un caficultor: prácticas de conservación de suelo limitadas o inexistentes, poco o ningún uso de fertilizantes, inadecuado manejo de la técnica de sombreado, bajos rendimientos (e.g., 5qq/manzana), y limitado procesamiento de la producción. Además, es práctica común vender la cosecha por adelantado al pulpero local quien recolecta la producción y la transporta y vende a otros centros de acopio. La falta de infraestructura hacia las sub-regiones cafetaleras dificulta la comercialización del producto, limitando la competitividad en los precios que se ofrecen al productor por el producto comprado en la finca.

Desde 1982, IHCAFE tiene un servicio de asistencia técnica en la región y paulatinamente ha ido introduciendo nuevas prácticas agrícolas. Desde que el programa opera en la región se han otorgado 120 créditos. Ese financiamiento ha sido otorgado para tecnificar aproximadamente 105 has., esperandose que durante 1987 puedan tecnificarse 25 has. adicionales.

La posibilidad de conseguir financiamiento para siembra de café ha conllevado a nuevos descombramientos de zonas dentro del bosque de hoja ancha. Dentro del programa del IHCAFE, 42 de las 105 nectáreas financiadas son plantaciones nuevas. Los vecinos hablan del impacto que esta tala tiene en las fuentes de agua que utilizan algunas comunidades (e.g., Mangulile). No existen, sin embargo, datos que nos puedan dar una idea de la magnitud del problema.

3.5. Los Ganaderos

La mayor parte de la tierra en fincas explotada en la zona del proyecto es tierra nacional. El usuario considera tener derecho a usufructar la tierra por el hecho de haberla descombrado, haberla cercado o haber adquirido las mejoras que otro haya hecho. Pequeños y grandes, agricultores y ganaderos, han procedido de la misma manera. En el caso de los ganaderos, sobre todo aquellos considerados como grandes, la apropiación de zonas boscosas para su eventual conversión a pasto es más evidente por el tamaño de las fincas. Son los ganaderos, más grandes, además los que muestran mayor cantidad de tierra en potreros con pasto cultivado. Es en base a esta tendencia es que Murray (1981) pudo concluir que la mayor parte de la actividad ganadera en las comunidades que él estudió se realiza en potreros establecidos.

La importancia de la ganadería en el caso de las fincas más grandes es una tendencia nacional y no un fenómeno nuevo. Datos censales correspondientes a 1974 para la región coinciden con las observaciones posteriores al censo hechas por Murray (1981). De acuerdo a esos datos censales, entre mayor es el tamaño de la finca mayor la cantidad de la superficie dedicada a pastos y mayor la proporción de fincas que reportan tener ganado. Es decir, mientras que únicamente 27% de la superficie en fincas con tamaño entre 10 y 50 has. eran pastos, esa proporción ascendía a 94% en el caso de fincas con un tamaño superior a 100 has. Por otro lado, 75% de las fincas con dimensiones entre 10 y 50 has. reportaron tener ganado. Ese porcentaje ascendía a 85% en el caso de las fincas entre 50 y 100 has. Todas las fincas mayores a 100 has. poseían hatos. El tamaño promedio de los hatos para cada una de esas categorías de tamaño era de 16, 35 y 86 cabezas respectivamente. El nivel de tecnología del ganadero parece tambien estar en relación con el tamaño de las fincas. Los datos censales señalan que en lo que a pastos se refiere, 62% de los pastizales de las fincas ganaderas más pequeñas que aquí se discuten eran pastos naturales o naturales mejorados. Ese porcentaje se reduce a 23% en el caso de las fincas ganaderas más grandes. Es decir, mientras que el forraje del ganado del "pequeño" ganadero era básicamente pasto natural, el forraje del ganado del ganadero "grande" era pasto cultivado: jaraguá o gigante. Por otro lado, los ganaderos de la región tienen ganado de doble proposito: leche y carne. No obstante, el estudio de Zúniga y Hernández (1977) así como visitas recientes de campos señalaron que mientras los ganaderos pequeños tienen generalmente ganado criollo, los ganaderos más grandes tienen con frecuencia ganado criollo cruzado con Brahman. La tecnificación de la ganadería parece atraer más a los ganaderos grandes que a los pequeños. El programa de crédito a la ganadería patrocinado por el Banco Mundial y ejecutado por BANADESA opera en la región. Este programa de crédito ha atraído hasta ahora a algunos de los ganaderos más grandes. Los créditos han sido otorgados en parte para el establecimiento de potreros, el mejoramiento de pastos y obtención de ganado mejorado. Para estos ganaderos, la falta de títulos de dominio pleno no ha sido una limitante para invertir y mejorar sus fincas. Debido a que la garantía para obtener créditos a través de este programa puede ser prendaria, el invertir en el mejoramiento de sus fincas representa una consolidación de su patrimonio. A traves de ese mejoramiento se asegura su continuo usufructo y eventualmente su propiedad.

Ciertos ganaderos, particularmente los pequeños y medianos, tienen la costumbre de quemar sus pastos al final del verano. Esa práctica tiene un doble propósito: controlar las garrapatas, y quemar los remanentes de pastos viejos para permitir el nacimiento de nuevo forraje con la llegada de las lluvias. Este procedimiento, como en el caso de las quemas agrícolas, puede tener un impacto negativo en el bosque si no se mantiene un control y se permite que el fuego se propague al bosque. Como en el caso de los agricultores, los ganaderos han empezado a solicitar permiso de COHDEFOR para realizar sus quemas. En los años 1985 y 1986, por ejemplo, COHDEFOR autorizó en el Municipio de La Unión 32 y 30 quemas de potreros respectivamente. Esta cobertura parece ser baja ya que en ese municipio hay alrededor de 150 fincas de menos de 50 has. donde se cría ganado. Si la práctica de quemar potreros fuera común a todas ellas, podríamos suponer que únicamente alrededor del 20% lo hacen con autorización. De los incendios forestales ocurridos en 1985 y 1986, 34% y 35% respectivamente fueron ocasionados por quemas de potreros no controladas. Obviamente, entre más pequeño el agricultor, mayor la posibilidad de tener pasto natural. En consecuencia, menor la posibilidad de que una quema de potreros arriesgue una inversión que haya hecho para mejorar la finca. Por otro lado, a mayor número de pequeños ganaderos, mayor su diseminación dentro de la región, y mayor la dificultad por parte de COHDEFOR de identificarlos y brindarles asistencia. La importancia de la ganadería en la generación de incendios forestales debe ser un elemento a tener en cuenta en cualquier plan de manejo forestal que se desarrolle bajo ese proyecto.

4. Implicaciones de las Características Socio-Económicas para el Proyecto

4.1. Enfoque Participativo

La integración de la población al aprovechamiento y manejo del bosque no únicamente es posible sino que tambien deseable. En el caso de los pequeños agricultores particularmente, la sub-población más numerosa, hay gran necesidad e interés en la creación de nuevas fuentes de empleo. Como se dijo anteriormente, la expectativa de poder participar en el aprovechamiento del bosque ha motivado ya a campesinos a formar asociaciones a fin de participar en actividades de explotación forestal que pudieran surgir como resultado del proyecto.

El uso de un enfoque participativo en la toma de decisiones respecto a las actividades económicas que podrían realizar los habitantes de las zonas de ejecución del proyecto, y adoptado en su ejecucion, es un enfoque adecuado. La participación en la toma de decisiones, no obstante, debe incluir a todos los sectores de la comunidad. Las oportunidades económicas que puede generar el proyecto pueden permitir el involucramiento tanto de agricultores como de ganaderos, y de las distintas sub-categorías que puedan existir dentro de esos dos grandes grupos. Murray (1981) señalaba que el hecho que actividades de resinación patrocinadas por COHDEFOR en el área de Yoro habían sido limitadas y por lo tanto selectivas, excluyendo consecuentemente a ciertos miembros de la comunidad, podría ser una de las causas que expliquen el elevado número de incendios forestales atribuídos por COHDEFOR a "criminales" o "piromaníacos". Es decir, según Murray (1981) se trataría de incendios provocados por personas que habrían sido perjudicadas por las actividades realizadas por COHDEFOR en esa región. Un enfoque balanceado que suponga, por ejemplo, actividades de (re)construcción de carreteras para habitantes con poco o ninguna tierra, actividades de resinación para pequeños productores de granos básicos, y acarreo de trozas a través de animales de tracción para ganaderos, podría ser adecuado para

lograr que diferentes sectores de la comunidad salgan beneficiados. Las actividades en que se involucren esos sectores no puede ser prevista de antemano, y deberan ser justamente decididas por los actores, mismos en conjunto con los técnicos, en base a los recursos y capacidades qe caracterizan a cada uno de esos actores. Las organizaciones y grupos ad hoc de productores que existen en la zona, como las pre-cooperativas forestales, la Junta Local de AHPROCAFE y el grupo de ganaderos con que COHDEFOR ha empezado a trabajar en La Unión, pueden ser los puntos de contacto iniciales para lograr involucrar a los distintos sectores socio-económicos de la región en el proceso de toma de decisiones. Obviamente, para mantener el interés de la comunidad en las actividades patrocinadas por el proyecto, es necesario que las primeras que se realicen permitan a los participantes obtener beneficios inmediatos y tangibles. Por otro lado, para evitar el surgimiento de conflictos entre miembros de la comunidad y usuarios del bosque de fuera de la comunidad, las actividades en que participen los habitantes de la zona del proyecto no deberan de limitarse a actividades no maderables. El madereo, probablemente la actividad más rentable en el aprovechamiento del bosque, no debera ser privilegio de empresas de fuera de la comunidad.

4.2. Modelo Organizativo

Las responsabilidades respecto al manejo del bosque no pueden corresponderle únicamente a una institución como COHDEFOR. El habitante rural que viven en áreas boscosas y que realiza actividades económicas que pueden tener un impacto negativo en el recurso debe tener un papel activo en ese plan de manejo. Su integración a actividades de manejo suponen, no obstante, su articipación en actividades de aprovechamiento que permitan la permanencia del bosque como patriminio. Es únicamente a través de la obtención de beneficios mediante un uso adecuado del bosque que este habitante rural puede darse cuenta de la necesidad de cuidarlo.

La integración de la población local, particularmente la de los habitantes de menores recursos como jornaleros y minifundistas, a actividades de aprovechamiento puede lograrse a traves de asociaciones campesinas. A través de esas asociaciones la coordinación de actividades de aprovechamiento, y eventualmente de manejo, así como la entrega de servicios y la comercializacion de productos obtenidos del aprovechamiento, puede hacerse de manera más eficiente.

Christiansen (1979) ha sugerido la validez del enfoque cooperativista para lograr la integración de la comunidad al aprovechamiento y cuidado del bosque. Sirviendose de dos ejemplos, uno en la zona de Danlí y otro en la zona de Atlántida, mostró como cooperativas agroforestales, aprovechando bosques de coníferas y latifoliados respectivamente, habían sido capaces de generar fuentes permanentes de empleo, permitir mayores ingresos a los asociados, asegurar la reinversión de excedentes, desarrolar la capacidad de liderazgo local, y despertar el interés en el cuidado del bosque, la reforestación y la administración adecuadas de las tierras forestales. Para llegar al punto de desarrollo de esas cooperativas utilizadas como ejemplo, sin embargo, se ha requerido sustancial apoyo institucional.

A pesar de que especialistas en cooperativismo hondureño han sugerido que las cooperativas forestales no enfrentan la magnitud de los problemas característicos de las cooperativas agropecuarias, los problemas que ambos tipos de cooperativas deben resolver son los mismos. Es decir, se trata de campesinos acostumbrados a la propiedad y trabajo individual quienes contrariamente a sus tradiciones son organizados para poseer y hacer uso

colectivamente de medios de producción puestos a su disposición. Esto incide en la falta de cohesión interna de los grupos constituidos e inactividad o deserción por parte de afiliados. Por otro lado, se trata de grupos con poca capacidad administrativa, característica que repercute negativamente en el manejo de fondos, la planificacion de las actividades de la cooperativa, y en la búsqueda de fuentes adicionales de ingresos a través de la diversificación de la producción. Aunque estos problemas existen son mas caracteristicos de las pre-cooperativas forestales, tambien se encuentran en las cooperativas que ya cuentan con su personería jurídica. Los ejemplos propuestos por Christiansen deberan ser entendidos como un índice de que lo ideal puede ser alcanzable. No obstante, constituyen la excepción y no la regla. En la medida en que las cooperativas han sido generalmente inducidas y no de generación espontanea, su consolidación requiere un apoyo institucional considerable. Apoyo que no siempre ha estado disponible.

Con el fin de evitar los problemas que han surgido como resultado de la inducción de cooperativas en el pasado, se sugiere que el proyecto adopte un enfoque organizativo evolutivo y gradual. Es decir, creación de organizaciones cooperativas únicamente despues de un afianzamiento de los vínculos de solidaridad existentes en la comunidad, y del logro de experiencias positivas en la realización de actividades colectivas parciales en que los miembros de las comunidades pueden manifestar un interés particular como puede suceder con tareas de aprovechamiento del bosque de cierta magnitud o la comercialización de productos. El proyecto debera brindar apoyo institucional en la planificación de actividades comunes, y en el caso que sea necesario, en aspectos administrativos y contables, a fin de posibilitar la consolidación de las asociaciones que puedan formarse, y permitir que la conversión de las asociaciones en cooperativas se realice con mayor facilidad que lo que la experiencia ha demostrado en el pasado.

Las actividades que se planifiquen podrian concebirse a partir del grado de consolidacion que caracterice a las asociaciones, y podrian orientarse hacia el logro de grados mayores de consolidación. A título de ejemplo, podrían ser las organizaciones consolidadas las que podrian dedicarse a las actividades de madereo arriba mencionadas. Las actividades de madereo podrian ser ejecutadas una vez que una asociacion dada adquiera el status de cooperativa. Dentro de esta perspectiva, COHDEFOR debería permitir que sean aquellos que participaron en actividades de resinación, y que lo hayan hecho de manera exitosa, los que tengan la primera opción para cortar los árboles resinados.

4.3. Apoyo a las Actividades Agropecuarias Actuales: Una Necesidad

La participación de la comunidad en el aprovechamiento del bosque debera ocurrir de manera gradual y teniendo en cuenta las actividades económicas que en este momento realizan los pobladores. Aun cuando los ingresos que generen actividades patrocinadas por el proyecto no constituyan más que ingresos complementarios para los participantes, la planificación de quien, como y cuando se efectuan trabajos tales como la (re)construcción de caminos, acarreo de trozas y resinación dentro del marco del proyecto, debera tener en cuenta que otras tareas deben realizar los pobladores como parte de sus ocupaciones principales. Esto permitiría evitar conflictos de interés entre las ocupaciones principales y las complementarias. De hecho, en la medida en que las actividades actuales de los pobladores (e.g., cultivo de granos básicos, caficultura y ganadería) suponen ya un uso del bosque, es

conveniente que los productores reciban el apoyo necesario para que el uso que se hace ahora de ese recurso se optimice y no afecte el plan de manejo que desea ejecutarse. El proyecto debera prestarle atención no únicamente a las actividades forestales propiamente dichas, sino que tambien a otra serie de problemas tales como la estabilización de la población que potencialmente puede practicar agricultura migratoria, a la libre circulación de ganado en áreas comunales de trabajo, y a la práctica de quemas agrícolas y de potreros. Opciones técnicas para resolver los problemas mencionados deberan ser propuestas y estudiadas con mayor detenimiento. La construcción de terrazas y el uso de insumos para intensificar la agricultura pueden ser consideradas para disminuir la agricultura migratoria. COHDEFOR debera igualmente continuar brindando asistencia técnica a los productores en la realizacion de las quemas agricolas y pecuarias. La necesidad de identificar y delimitar sitios comunales de pastoreo debera ser analizada. Lo mismo puede decirse acerca de la creación o expansión de programa de crédito y asistencia técnica para los pequeños y medianos ganaderos a fin de poder permitirles una mayor tecnificación. Con el fin de evitar la búsqueda de nuevas tierras por parte de los ganaderos de mayor tamaño es necesario seguir apoyando la tecnificación de fincas que ya se ha iniciado a fin de que los potreros tengan mayor capacidad de carga. Por otro lado, tambien puede considerarse la posibilidad de dejar que su ganado paste en áreas boscosas donde haya habido raleos. Esta debera ser una posibilidad temporal que suponga un control de la cantidad de animales que alli pasten. Este control puede realizarse limitando el número de cabezas por ganadero que pueden participar en el programa o, si las posibilidades lo permiten, cobrando por animal que paste en esas areas. En la medida en que COHDEFOR probablemente no tiene ni el mandato ni la capacidad institucional para tratar problemas agronómicos debera buscar el apoyo de otros organismos públicos y privados que trabajen en ese campo en la región del proyecto. El proyecto, por intermedio de COHDEFOR, podría buscar el fortalecimiento de los programas de asistencia técnica y crediticia en apoyo a la agricultura, caficultura y ganadería que existen en la región a través del Ministerio de Recursos Naturales, el PTR, IHCAFE, BANADESA y Visión Mundial. Debido a la atención que debe brindarse a las actividades agrícolas y pecuarias a través del proyecto, se sugiere la contratación de un experto extranjero en desarrollo agropecuario que pueda sugerir alternativas y ocuparse de su ejecución, independientemente de cual sea el mecanismo institucional que se adopte para lograrlo.

4.4. Papel de las Mujeres en el Proyecto

Las mujeres juegan un papel económico importante en la economía rural. Por un lado, en base a datos censales se ha estimado que alrededor de una cuarta parte de los jefes de las familias rurales son mujeres. Murray (1981) señaló en ese sentido que en las comunidades que él estudió, en un número importante de hogares no habian hombres adultos. En algunos casos, esto se debia a la migración temporal masculina por razones laborales. En otros, sin embargo, se trataba simplemente de mujeres solas con familia a cargo. Por otro lado, las actividades en que la mujer participa pueden permitir la generación de ingreso. Este puede ser o no un ingreso secundario. El ingreso aportado por la mujer puede obtenerse a traves de su desempeño en actividades productivas propias. Tambien puede obtenerse a traves de la transformación de productos agrícolas, a los que la mujer agrega valor.

El hecho que mucho del ingreso generado por una mujer sea ingreso secundario puede permitirle adoptar una actitud más intrepida frente a la adopción de nuevas tecnologías. Por otro lado, su involucración en la transformación de ciertos productos agrícolas puede crear una apertura frente a tecnologías que permitan aumentar la productividad de aquellos productos que transforma.

La inteprepidez de las mujeres fue descubierta en un evaluación de un proyecto de reforestación y conservación de suelos ejecutado por COHDEFOR hace algunos años en la zona de Omoa, Yojoa y Macuelizo. Reportando los hallazgos de esta evaluación, Wiff (1984) ha señalado que son las mujeres las que mostraron mayor interés inicial en las actividades de este proyecto. La apertura que expresaron sirvió para que los hombres se dieran cuenta del impacto que podían tener ambas actividades en la generación de ingreso. No fue sino hasta que las mujeres lograron resultados positivos, en pequeña escala, que los hombres optaron por emularlas. Es decir, la intrepidez y apertura por parte de las mujeres sirvió de punto de entrada para actividades agro-forestales que números mayores de agricultores pudieron más tarde realizar.

Las mujeres han mostrado sensibilidad particular a las actividades de conservación de suelos en el Proyecto de Manejo de Recursos Forestales (522-0168). Las mujeres han jugado tambien un papel significativo en las actividades de resinación de las actuales cooperativas agro-forestales. De hecho, mucho del trabajo asociado con la resinación en esas cooperativas es realizado por mujeres, sean o no miembros de las asociaciones.

Por otro lado, la mujer es a menudo la encargada de convertir la leche obtenida en la finca a productos lácteos: cuajada, queso y mantequilla. En la medida en que puede tener un poder de decisión respecto al uso de los ingresos generados por la venta de tales productos, puede mostrar sensibilidad frente a programas de manejo de forrajes que repercutan en la producción de la leche. Igualmente, puede mostrar sensibilidad frente a programas de desarrollo forestal que repercutan en la cantidad de leña disponible para el consumo familiar, actividad enteramente de su dominio por su responsabilidad en el aprovisionamiento de combustible para la preparación de alimentos.

Por estas razones, el proyecto debera promover activamente la participación de la mujer en las actividades que puedan realizarse, sobre todo como miembro de las organizaciones que tomaran decisiones respecto a los sub-proyectos que la comunidad ejecutara. Por otro lado, los mensajes de transferencia tecnologica que se difundan deberan de tener en cuenta el papel que juega la mujer en la economía familiar.

4.5. El Proyecto y las Municipalidades

El proyecto no debera excluir del proceso de desarrollo regional a las autoridades municipales. La ley obliga a la COHDEFOR a pagarles a las municipalidades una parte del dinero obtenido por tronconaje que haya sido recolectado por el corte de árboles extraídos de terrenos ejidales. En función de las actividades de madereo que se realicen como parte del proyecto, las municipalidades podrían eventualmente disponer de recursos adicionales para la realización de obras comunales.

Bibliografía

Censos de Población. 1950, 1965, 1974.

Censos de Agricultura. 1952. 1965, 1974.

Christiansen, P. H. Las Cooperativas Forestales a Nivel Comunitario. Estudio de Tres Casos: México, Guatemala y Honduras. FAO, 1979.

Galvez Mejía, Ernesto. Consideraciones Socio-Antropológicas en Torno al Estudio de Impacto Ambiental para el Proyecto de Manejo Forestal. 1986.

Murray, G. F. Mountain Peasants of Honduras: Guidelines for the Re-ordering of Smallholding Adaptation to the Pine Forest. AID/Honduras, 1981.

Noronha, R. and J. S. Spears. Sociological Variables in Forestry Project Design. In M. Cernea (Ed.), Putting People First. Sociological Variables in Rural Development. Oxford University Press, 1985.

Padilla, H. Análisis Técnico-Administrativo de la Cooperativa Agro-Forestal Lepaterique. DIFOCCOP, 1985.

Padilla, H. Situación Actual de las Organizaciones Socio-Forestales. DIFOCOOP, 1985.

Uphoff, Norman T. et. al. Feasibility and Application of Rural Development Participation: A State-of-the-Art Paper. Rural Development Committee, Cornell University. 1979

Wiff, M. Honduras: women make a start in agro-forestry. Unasylva. 1984, Vol. 36, No. 146, pp. 21-26.

Zúniga, M. y Hernández, O. Estudio del Impacto Socio-Ecónomico del Proyecto de Pulpa y Papel. COHDEFOR, 1977.

Personas Entrevistadas

Ramón Corano. COHDEFOR. Jefe de la Unidad de Manejo de Juticalpa.

René Lara. COHDEFOR. Jefe de la Unidad de Protección de Juticalpa y Antiguo Jefe de la Unidad de Manejo de La Unión.

Carlos Barahona. COHDEFOR. Jefe de la Unidad de Manejo de La Unión.

Hector Andrade. BANADESA. Oficial de Créditos y Administrador del Programa de Apoyo a la Ganadería.

Edgardo Osorio. Programa BANADESA/Banco Central de Honduras Técnico del Programa de Apoyo a la Ganadería.

Mario Puerto. Departamento de Investigación, DIRCO. Ministerio de Recursos Naturales.

Alejandro Carcámo. Ganadero de La Unión.

Francisco Vivas. Ganadero de La Unión.

Ramón Alcides. Alcalde y Caficultor de La Unión.

Junta Directiva Pre-Cooperativa Agro-Forestal La Unión

Horacio Padilla. DIFOCCOP.

ANNEX K

ENVIRONMENTAL ASSESSMENT

FORESTRY DEVELOPMENT PROJECT

(522-0246)

Location: Honduras, Central America
Funding: $8.0 Million (Grant); $12.0 Million (Loan)
GOH Counterpart Contribution $11,688 Million
Life of Project: 7 years (12/1987 - 12/1994)

UNCLASSIFIED STATE 264984

ACTION: AID-2 INFO: DCM ECON CM1/5

8

V2CZCTG0365 25-AUG-87 TOR: 21:55
OO RUEHTG CN: 00455
DE RUEHC #4984 2372153 CHRG: AID
ZNR UUUUU ZZH DIST: AID
O R 252151Z AUG 87 ADD:
FM SECSTATE WASHDC
TO RUEHTG/AMEMBASSY TEGUCIGALPA IMMEDIATE 3739
INFO RUEHSJ/AMEMBASSY SAN JOSE 6364
BT
UNCLAS STATE 264984

AIDAC TEGUCIGALPA/LKLASSEN; SAN JOSE/ROCAP/EZADROGA

E.O. 12356:356: N/A
TAGS:
SUBJECT: FORESTRY PROJECT EA APPROVAL

1. LAC CHIEF ENVIRONMENTAL OFFICER HEREBY APPROVES THE ENVIRONMENTAL ASSESSMENT FOR THE HONDURAS FORESTRY DEVELOPMENT PROJECT (522-0246).

2. MISSION IS COMMENDED ON QUALITY OF WORK AND COMMITMENT TO INCORPORATING RECOMMENDATIONS OF THE EA INTO THE PROJECT. WHITEHEAD
BT
#4984

NNNN

UNCLASSIFIED STATE 264984

IMMEDIATE

OFFICE	ACTION	INFO
MD		✓
DMD		✓
MGT		✓
M[illegible]		
[illegible]		
[illegible]		
LP		
LF	DE	
[illegible]		
PD		✓
[illegible]		
[illegible]		
[illegible]		
[illegible]		
HRD		
HSP		
EPA		
DOCA		
RIG		
RHUDO		
CH.CN		✓
REA[illegible]		✓
OTHER		
C&R		

DUE DATE 08/27
ACTION TAKEN
ATTACHMENT YES NO
INITIALS

215

TABLE OF CONTENTS

	Page
I. SUMMARY	i
Introduction	i
Alternatives Considered	i
Vicinity Map	ii
Major Conclusions	vii
1. Tropical Forest Depletion	vii
2. Biological Diversity	vii
3. Timber (Commercial Pine Forests)	viii
4. Soils and Water	viii
5. Wildlife, Fisheries and Endangered Species	ix
6. Natural Vegetation and Wildlands	x
7. Economic and Social Effects	x
8. Land Use and Colonization	xi
9. Air Quality	xi
10. Recreation and Tourism	xi
11. Archaeological, Cultural and Historic Resources	xii
12. Visual Resources	xii
13. Public Services	xii
14. Institutional Factors	xii
15. Potential Conflicts with Other Projects/ Institutions	xiii

TABLE OF CONTENTS

II. PURPOSE OF AND NEED FOR ACTION	1
Purpose and Nature of Action	1
Contents of Environmental Assessment	7
Cooperating Institutions	8
III. ALTERNATIVES	9
Development of Alternatives and Alternatives not Considered	9
A. Forest Development Project (522-0246)	11
B. No Action	11
Comparison of Impacts by Alternative	17
Identification of the Preferred Action	27
IV. AFFECTED ENVIRONMENT	
Introduction	30

Description of the La Union Forestry Management Unit
Biophysical Characteristics 30
Size, Location and Physiography 30
Climate 31
Geology and Soils 31
Minerals 32
Water Resources 32
Watershed Interactions and Hydrology 32
Downstream Wetlands 34
Water Quality 34
Water Uses 34
Timber (Commercial Pine Forests) 35
Life Zones 35
Natural Vegetation and Wildlands 37
Plants 37
Wildlife and Sensitive Species 37
Importance of Wildlife 38
Fisheries 38
Air Quality 38
Range 39

Socio Economic Characteristics 39
Population 39
Education 39
Public Services 40
Health 40
Other Public Services 40
Roads and Transportation 40

Other Resources/Uses 42
Land Tenure 42
Land Use 42
Agriculture 42
Agricultural Extension and Credit 42
Tourism and Recreation 43
Archaeological, Cultural and Historic Resources 43
Visual Resources 43

V. ENVIRONMENTAL CONSEQUENCES 44

Biophysical Resources 44
Soil and Water 44
Timber (Commercial Pine Forests) 46
Natural Vegetation and Wildlands 48
Wildlife, Fisheries and Endangered Species 50
Air Quality 52
Biological Diversity 53
Social and Economic 55
Economic Development 55
Social and Cultural Development 55
Transportation and Public Services 56
Other Resources 56
Land Use and its Regulation 57
Tourism and Recreation 57

Archaeological, Cultural and Historic Resources 57
Visual Resources 57

Possible conflicts between alternatives and objectives/actions of other organizations and the GOH 57

Institutional roles and capacities for the implementation of alternatives 59
COHDEFOR 59
AHE 59
RENARE 59

Secondary effects resulting from the alternatives and their significance 60

Irreversible or irretrivable commitment of Resources 61

VI. MITIGATIVE MEASURES, PROJECT CONDITIONS AND COVENANTS (Preferred Alternative) 63

Institutional Reorientation of COHDEFOR 63

Forest Management of Selected Areas 63
Forest Management Activities (La Union) 63
Forest Management Plan and Contract 63
Fire Management 64
Pest Control 64
Management by Life Zones 64
Community Watershed Management 65
Protection Forests/Reserves 65
Hydrological/Biological Reserves 65
Production Forest Reserves 65
Forest Roads and Trails 66
Silvicultural Practices 67
Forest Harvest Practices 67
Wildlife Management 67
Protection of Biological Diversity 68

Strengthening Forest Industry 69

Credit 69
Colonization 69
Applied Research and Demonstration 69
Training and Technical Assistance 70
Environmental Education for Local Communities and Nationwide 70
Technical Assistance 70
Project Management 71
Environmental Assessment and Baseline Studies 71

Conditions Precedent and Covenants 71

VII. LISTS OF PREPAPERS AND CONTRIBUTIONS 73

VIII. APPENDICES 74

A. Life Zones and Species Lists 74

B. Glossary 77
C. Bibliography 78

LISTS OF MAPS

1. Forest Map of Honduras ii
2. Honduras and the La Union Forest Management Area vi
3. Roads, Rivers and Towns - La Union FMU 41
4. Life Zones 36
5. Soils 33
6. Patterns of Biological Diversity - Alternative A 54
7. Protection Areas - Alternative A 49

LIST OF FIGURES

1. Timber Production in Honduras, with and without FDP 23
2. Forest Types and other Land Uses in La Union 35
3. Area and type of Land Tenure in La Union 42

LIST OF TABLES

1. FDP Outputs and Verifiable Indicators 12-16

SUMMARY

INTRODUCTION

The Agency for International Development through its Latin American and Caribbean Bureau and Chief Environmental Officer, made a positive determination for the Initial Environmental Examination of the Honduras Forestry Development Project, requiring that an Environmental Assessment (E.A.) be carried out. The positive determination was based on the potential for significant environmental impact by the tree harvesting and other forest management actions of the project, and recent congressional legislation (Section 118 of FAA) requiring an E.A. for 11 forestry projects that procure or use logging equipment; result in the colonization of forest lands or conversion of forest lands to grazing; or result in the construction, upgrading or maintenance of roads (including temporary haul roads for logging) which pass through relatively undegraded forests.

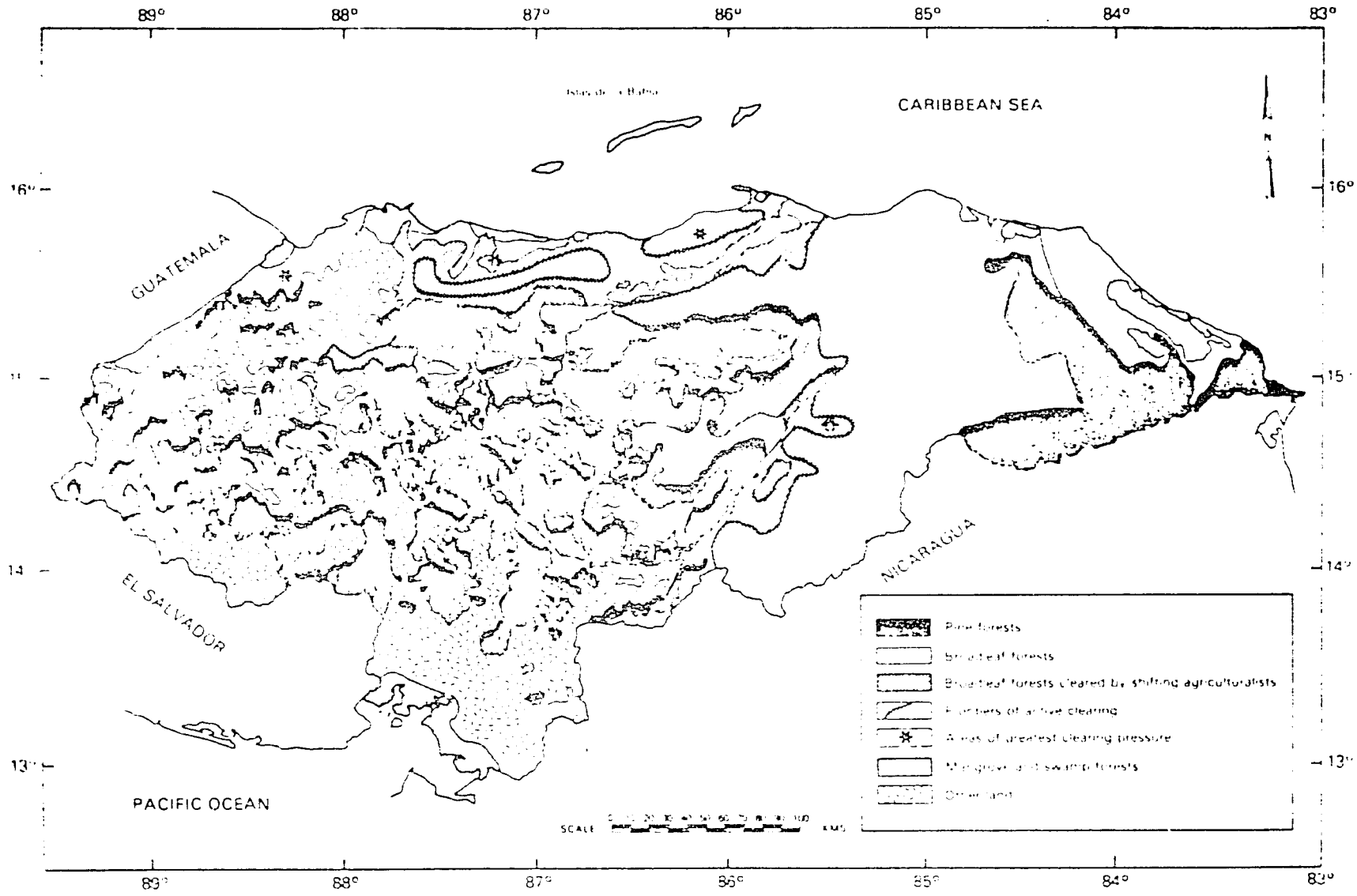
In accordance with Section 216.3 of the A.I.D. environmental procedures, an environmental assessment scoping exercise was carried out by a team of US and Honduran specialists representing U.S. Government and Honduran public and private organizations.

ALTERNATIVES CONSIDERED

This Environmental Assessment has been completed to evaluate the environmental effects of the Forestry Development Project (FDP), along with a No Action Alternative. Alternative A (preferred alternative) proposes the implementation of the FDP with the GOH.

The Forestry Development Project is designed to improve the management and sustainable productivity of commercial pine forests and the efficiency of industrial and artisanal conversion and marketing of wood products. Its implementation involves the institutional reorientation of the Honduran National Forestry Corporation (COHDEFOR) as the lead institution. COHDEFOR is strengthened to focus on forest resources regulation and management and greatly reduce its traditional role in lumber production and marketing. The project also strengthens the private sector to more efficiently and in an environmentally sound manner, carry out logging, sawmilling, marketing, and export of forest products (lumber). On a pilot basis pine forest management activities will be carried out in selected areas. The project alternative involves the development of the activities described in the Agency for International Development Project Paper and 13 attached Annexes, one of which is this Environmental Assessment (Annex K). The "No Action" Alternative considered continuing current resource management and exploitation activities without Forest Development Project inputs.

MAP No. 1: Forest Map of Honduras



Source: Honduras Country Environmental Profile, a Field Study. JRB Associates, 1981. Pg. 75

The project consists of three integrally related components: (1) institutional reorientation/support of the Honduran National Forestry Corporation (COHDEFOR); (2) forestry management; and (3) strengthening of the private sector forest industry. The institutional component with COHDEFOR involves the formulation and implementation of policies (e.g., stumpage valuation and timber sales) as well as technical and environmental procedures to rationalize the utilization of pine forest resources. It also includes the upgrading of COHDEFOR's institutional capacity -- e.g., financial management, personnel procedures and operational processes. The underlying objective of these activities is to enhance the Corporation's capability to manage the forest as a renewable resource and support the private sector in commercializing lumber and wood products. The forest management component will consist of a package of forest protection, environmental management and forest utilization interventions that will be applied, on a pilot basis, in two timber reserve areas. The protection activities emphasize the introduction of technologies for fire prevention, fire suppression, disease control and environmental protection. Forest utilization efforts focus on the presentation of modern logging, silviculture and agroforestry practices. These technologies will be monitored, and altered where necessary, so that by the end of the project a set of treatments will be available for application throughout the country.

The private strengthening component is composed of technical assistance, training, and credit to support loggers, timber processors and lumber exporters in improving the productivity of the wood products industry. A technological package of management practices and environmental technical guidelines accompany the credit to assure sound resource management and protection. COHDEFOR will be the lead executing agency for the project. Through a Project Implementation Unit that will be created for this effort, the Corporation will coordinate all project inputs. The Ministry of Natural Resources, through the technical personnel of the A.I.D. financed Natural Resources Management Project, will assist the Corporation to carry out agroforestry and soil and water conservation extension activities among the farmers in the target areas. A Private Voluntary Organization will be engaged to establish a cottage industry program with the beneficiaries. The credit resources for the private sector will be managed by a local bank that will be selected on a private basis. A private bank will provide technical assistance to the loggers and sawmillers in the packaging of loan applications.

The institutional reorientation/strengthening of COHDEFOR and the private sector forest industry components will be carried out at a national level directly affecting commercial pine forests subject to the COHDEFOR concessions/contracts. The forest management component will be implemented in two forest management units (FMU) and planning will occur for a third area by the end of the project. La Union, the FMU identified at the outset of project, will serve as a model for field-level planning and project implementation; the experiences and technologies gained here will be transferred to other FMUs.

222

Major references for this Environmental Assessment are the Honduras Country Environmental Profile (J.R.B. Associates, August, 1982) which gives an overview of environmental conditions and problems for the country, and the Honduran Ecological Association Report, "Identification of Possible Environmental Impacts caused by the Proposed Forestry Development Project in La Union, Olancho" (AHE, December, 1986) which presents potential impacts and mitigative measures for the Project and its proposed actions in the La Union FMU. The detailed description of the project design is presented in the USAID Project Paper, Forestry Development Project (5).

AREAS OF CONTROVERSY AND CONCERN

The E. A. scoping team identified insufficient analysis and information in the I.E.E. in four principal areas. These issues will be addressed in great depth in this E.A.:

1. What institutional roles are appropriate and what resources (human and financial) are needed by these institutions to carry out mitigative measures? This includes consideration of technical assistance to be funded by the project. Institutions to be considered here: COHDEFOR, AHE and RENARE.

2. What is the potential for an impact of colonization in forest management areas, and what measures can be taken to minimize squatting on forest lands?

3. What additional technical guidelines and mitigative measures are needed to avoid environmental impacts from logging on steep slopes and forest road construction/maintenance? Is there sufficient institutional capability and willingness within COHDEFOR to regulate and control these environmental impacts?

4. What additional mitigative measures are required for the management of protection forests and conservation of wildlife and biological diversity?

Based on the results of the I.E.E., E.A. scoping exercise, and the professional judgment of the specialist/interdisciplinary team that participated in this environmental assessment process, the following seven criteria were established in their order of importance, as the basis for alternative evaluation:

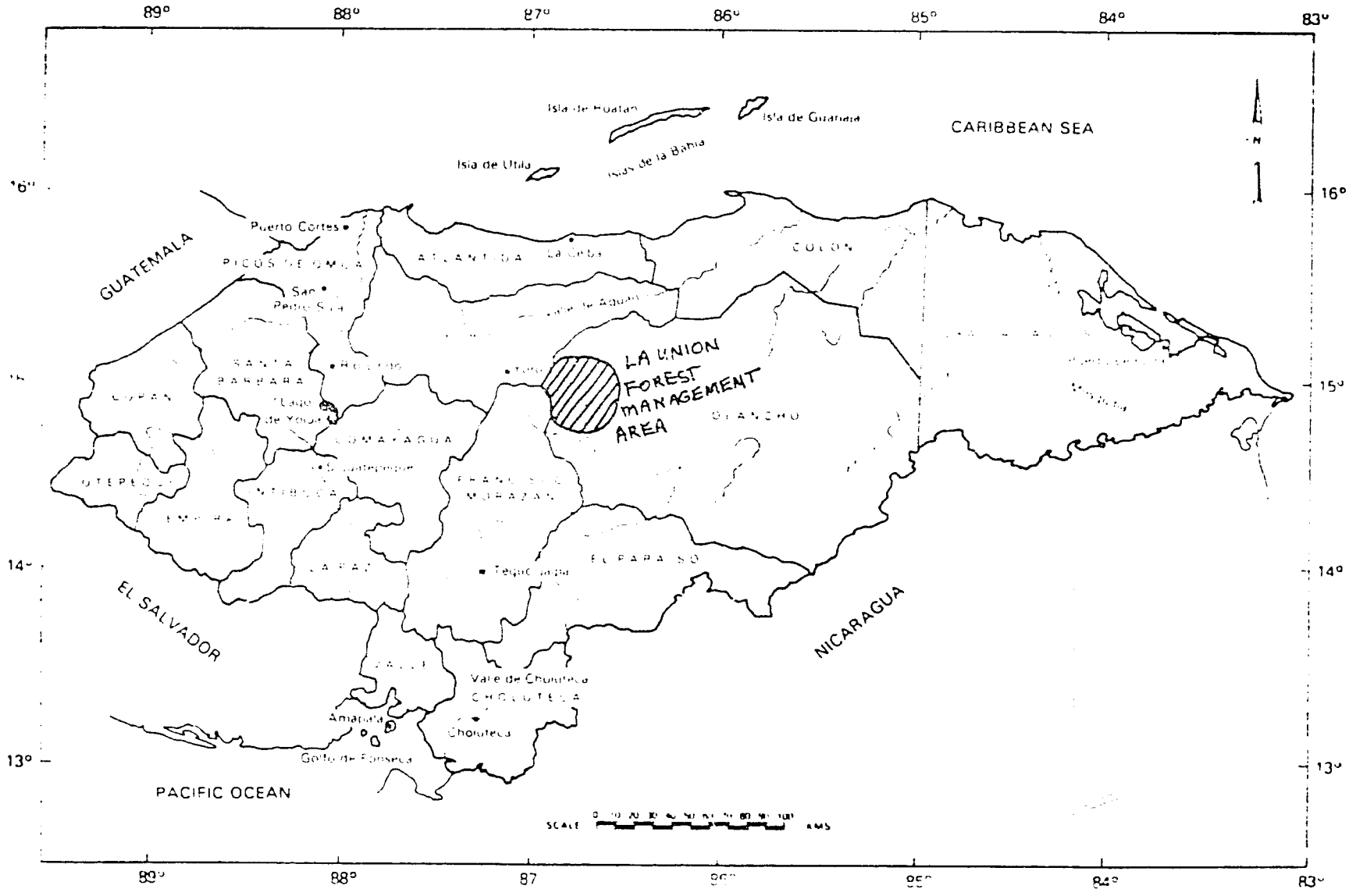
1. Tropical Forest Depletion
2. Biological Diversity
3. Socio-Economic Benefits
4. Timber (commercial pine forests)
5. Physical Environment and Downstream Impacts
6. Land Use Stabilization and Colonization
7. Institutional Feasibility

OPPORTUNITIES

In terms of opportunities, Alternative A (the Forest Development Project) proposes to take advantage of a series of reforms, recently enacted by COHDEFOR and a willingness on the part of COHDEFOR and the GOH to correct major deficiencies in the forestry sector that have over the past 20 years led to the degradation of environmental quality and depletion of forest resources in Honduras. It appears that not only would a technically sound intervention contribute to substantially reducing the environmental degradation that currently occurs as a result of forest harvest in Honduras but it would also, by promoting sound forest management, contribute to economic stabilization and rural development based upon a change to sustainable use of the forest resource. This opportunity should be taken into consideration in the context of current trends of environmental degradation in Honduras and the risks and benefits of the two alternatives analyzed in this E.A.

224

MAP No. 2 Honduras and the La Unión Forest Management Area



Source: Honduras Country Environmental Profile, a Field Study. JRB Associates, 1981. Pg. 17

225

MAJOR CONCLUSIONS

1. Tropical Forest Depletion.

Using the La Union Forest Management Unit (FMU) as an illustration, the Forestry Development Project (FDP) Alternative will protect highland broadleaf forest currently under pressure and being encroached upon. Also, the FDP alternative will assure the protection of riparian natural areas and will reserve steep pine forest lands where tractor and oxen logging cannot be carried out in an environmental sound and safe manner. Commercial pine forest lands will be harvested and regenerated in a sustainable manner and in accordance with sound environmental guidelines/regulations, resulting in a patchwork of age classes and more healthy rejuvenated stands. It is reasonable to expect that the positive environmental consequences of sound forest management illustrated for La Union would be extended to other FMU of the country.

The "No Action" Alternative will afford no protection to the highland broadleaf forests and would likely result in traditional forest harvest (tractor logging) of all commercial pine forests. The probable results would be the continued encroachment into and conversion of major portions of broadleaf forest into agricultural uses (coffee, basic grains) and the depletion of commercial pine forests due to improper protection from fire and grazing and uncontrolled colonization. Current forest harvest practices employ few if any environmental regulations and mitigative measures, and further development in the field of environmental protection relating to forest management would not be expected.

2. Biological Diversity.

Currently, biological diversity is rapidly being lost throughout Honduras with deforestation and conversion of broad leaf forests and the degradation of pine forests. As is illustrated by the concept of the La Union FMU the FDP alternative would lead to the conservation of several types of natural areas with their associated native fauna and flora. Two wildland areas would be protected as well as riparian vegetation adjacent to streams, rivers and springs. Islands of steep pine forest with slopes in excess of 50% would also be reserved. Measures would be taken to conserve wildlife and protect rare and endangered species in highland broadleaf forests. The environmental management practices to be associated with improved forest management will contribute to the protection of biological resources in many ways.

The "No Action" alternative will neither promote nor enact actions to preserve biological diversity. Using the La Union FMU as an example, the pressures of colonization and logging are already upon La Union forest lands and no action implies little or no regulation and an accelerating loss of biological diversity through uncontrolled logging/conversion,

226

fire, grazing and colonization. Uncontrolled development pressures, currently operative include deforestation from coffee farming, two major roads that will interconnect La Union (and Tegucigalpa) with Yoro and the north coast, and two logging concessions, one in the western and another in the southeastern corners of the Unit.

3. Timber (Commercial Pine Forests)

The total number of hectares of commercial pine forest to be harvested is less for the FDP than for the No Action Alternative. Steep pine lands not suitable and safe for traditional logging practices will be reserved until more sophisticated, environmentally sound and safe logging practices are found and demonstrated. Also riparian vegetation, including some commercial pine, will be protected based on the National Forestry and Water Laws and sound technical judgment. Community water supplies/watersheds will be protected by more restrictive contracts and guidelines/i.e. a 40% slope restriction instead of 50% for logging and roading. Monitoring of logging practices and impacts will be performed, and the slope restriction would be adjusted up or down according to observed resource damage. The total hectares removed from long-term timber harvest and the reduction in potential timber yield is unknown at this time for La Union and the other FMUs to be selected. These data would be generated with the development of the forest management plans for each unit.

The "No Action" Alternative would probably place little or no restrictions on timber concessions and total hectares covered by concessions/permits and potential timber yields would initially be greater. With the forest resource depletion and conversion effects outlined above, future timber yields would be progressively smaller.

4. Soil and Water

Surface erosion impacts would result from both alternatives although spatial and quantitative relationships would vary greatly. Water quality, as measured by turbidity, would be monitored and regulated under Alternative A (FDP) but not under B. Stricter water quality standards would be established and enforced for community watersheds under Alternative A but not for B. In the case of the La Union FMU, downstream siltation and flooding impacts are potentially significant and costly for the middle and lower Aguan Valley. In Alternative A, strict mitigation measures for logging and road construction/maintenance are contemplated in the FMU to reduce project-related impacts. Assistance would be provided for soil and water conservation practices and agroforestry on agricultural lands.

There is a potential for mass erosion on all four soil series of the La Union FMU. Mass erosion can increase substantially following extensive forest harvest and road/trail construction where a potential for mass

227

erosion existed. Mass erosion mitigative measures for logging and road construction and would be carried out under Alternative A. Resources for mass erosion control measures would probably not be available under Alternative B.

5. Wildlife, Fisheries and Endangered Species

On FMU lands, the predominant vegetative type, in general, would permanently shift from older, mature and over-mature pines to younger pine forests in different stages of regeneration (age classes). Year-long use would increase with logging and the opening up of additional forest roads and trails.

The FDP Alternative would protect wildlife habitat in its natural state along streams, on steep pine forests and in the highland broadleaf forests, (which is where there is the greatest concentration and diversity of wildlife and in the case of La Union the only known area where major endemic species occur). Regulated forest management in pine forest areas would take into account wildlife values and would result in some enhancement of habitat. With the rejuvenation of the forest, there will be greater potential for wildlife productivity. A limited number of snags and den trees will be protected in logged over areas. The protection of riparian vegetation and certain watershed management practices will reduce sedimentation impacts and be more protective of native fish species. In the case of La Union, a few rare and endangered species are known to occur (jaguar, quetzal, tapir, white-lipped peccary and mountain lion) in habitat of the highland broadleaf forests. These forests would be protected with Alternative A, but not with B. Illegal hunting and fishing would be closely controlled by COHDEFOR and RENARE under Alternative A (FDP) but would probably go largely uncontrolled under Alternative B.

Under the "No Action" Alternative the protection of natural areas and the enhancement of wildlife habitat would not be provided for. With a reduced institutional presence and regulatory capability on the part of COHDEFOR, traditional logging and development in FMUs would lead to the depletion of wildlife and fisheries resources and greater impact on rare and endangered species in adjacent broadleaf forests.

Because Alternative A would restrict habitation to agricultural land in the Forest Management Unit, human activity would generally be more concentrated on private lands (inholdings and farms in agricultural valleys). Pressure on wildlife would continue to be high, since neither alternative provides for wildlife management on agricultural lands.

With Alternative A $15,000 in local currency is set aside to inventory and study wildlife in the area, and rare/endangered species of plants and animals. These studies would be carried out during the FMU planning stage and the required mitigative measures would be implemented as part of forest management actions.

228

6. Natural Vegetation and Wildlands

Alternative A would have a positive effect on the management of natural areas and protection of wildlands within and around forest management units. Citing the La Union as an example, two major wildlands, pine forest reserves (where slopes are too steep for logging), and riparian natural areas along streams and water bodies will be protected as part of COHDEFOR's forest protection actions. Private organizations would contribute environmental education and research/inventory work that would lead to better public and institutional awareness and cooperation in the protection of fragile natural areas, and a better scientific knowledge of resources and environmental relationships. One of the most significant contributions of the FDP would be the sustained management of the natural pine forests of Honduras. Greatest benefits will occur in the selected FMUs, however positive impacts would be expected in pine forests throughout the country over the life of the project.

Alternative B will not contribute resources nor strengthen institutional capabilities for the management of natural vegetation and protection of wildlands. Specific natural areas would probably not be identified nor managed in FMUs.

7. Economic and Social Effects

Substantial and equitable social and economic benefits currently are not being derived from the forestry sector in Honduras. Most rural people living in forest areas do not participate in and benefit from forest industries. The FDP Alternative (A) would promote social forestry and lead to participation of the local communities of FMUs in forest harvest operations and small scale forest industries. Alternative A benefits will include increase income generation and rural employment. Also, sustainability of non-foresty activities will be promoted through extension work in improved agricultural and grazing practices. However, greater restrictions will be put on the personal liberties of small farmers in and around FMUs to prevent conversion of forest lands and encourage improved land use and intensification of agricultural and grazing practices. Also loggers will be required to improve the technical quality of their operations and comply with environmental procedures/regulations.

The "No Action" Alternative will not have the forestry-based economic reactivation benefit. Likewise it will not impinge upon the traditional personal liberties of small farmers and loggers.

Demographic effects are difficult to predict. For the La Union FMU, Alternative A will carry out a series of actions to prevent spontaneous colonization, direct project benefits toward the resident population of rural small farmers, and, with localized economic reactivation, reverse the outmigration of younger members of the population to cities. A dispersed forest management activity should not result in redistribution

and concentration of the local population but rather, with incremental improvements in income, public services and health, a gradual increase in population by spontaneous reproduction. The "No Action" Alternative would result in short-term population increases locally concentrated in support of logging operations and along the two new regional roads being constructed - Mangulile to Yoro and La Union to Mame. Long-term population growth in the La Union FMU, however, would be based on services generated by the new roads; the rural population dependent upon forest industries and agriculture would increase with short-term resource exploitation and then tend to decline with long-term resource depletion.

8. Land Use and Colonization

Only in general terms can land use impacts be predicted for FMUs affected by the alternatives. With the FDP implementation land use of forested areas would be stabilized as sustainable forest management operations were established. Colonization and conversion of forest lands would be reduced and agricultural (and grazing) practices would be concentrated on private and non-forested lands. As illustrated by the La Union FMU, certain forest reserve lands would be set aside permanently by presidential or congressional decree for environmental protection reasons. The value of private and residential lands, including adjacent agricultural lands, would probably increase in value over the LOP due to land use stabilization and economic revitalization.

Alternative B would lead to spontaneous colonization and conversion of lands to agricultural and grazing uses in FMUs. This would result in a gradual loss of forest lands and/or the degradation of commercial pine forest from fire and grazing.

9. Air Quality

The most serious impact to air quality will be caused by forest fires which release smoke and particulate matter into the atmosphere. Both alternatives will result in some reduction in air quality during the dry season, which occurs throughout Honduras. Alternative A would include prescribed burning, which would be carried out on days when burning conditions are best for dispersion of smoke and cool fires. The total area burned annually would probably be less with Alternative A. Alternative B would allow frequent and indescriminate burning by campesinos, carried out without regard for air quality.

Agricultural burning would probably remain about the same for both alternatives. Air quality impacts, although significant, are not as subject to mitigation as many of the other impacts considered.

10. Recreation and Tourism

The amount and kinds of recreational opportunities occurring will vary greatly from one FMU to the other. For the La Union area these opportunities are limited by distance from population centers and the

general abundance of forest and remote places in the country side. Most rural communities and people are not constrained by the lack of recreational opportunities. Alternative A, through the creation of protection areas (wildlands) and their multiple-use management, will offer limited recreation and scientific tourism opportunities. Alternative B would not guarantee any opportunities for long-term scientific studies nor tourism.

11. Archaeological, Cultural and Historic Resources

Analysis has only been carried out for the La Union FMU where no unusual archaeological, cultural and historic resources are known. Alternative A incorporates the provisions that if such resources were detected in FMUs affected by the FDP, further assessment would be carried out to determine the value of such resources and, if justified, actions would be taken to solicit assistance to manage and preserve the sites.

12. Visual Resources

Alteration in visual resources and aesthetics will occur with both alternatives.

13. Public Services

Commonly, public services are deficient in most rural areas of Honduras. Public services are not the focus of attention in the FDP although it is expected that with the economic reactivation and orientation of benefits toward the local rural population resulting from sustained yield forestry, spontaneous improvements in public services will result. Perhaps most affected, public health should improve with Alternative A resulting from increased incomes and employment, and consequent improved nutritional status. Likewise, safer logging practices should result in fewer accidents and the management of community water supplies would reduce the cases of gastrointestinal infections, which is one of the leading cause of deaths in the La Union area. Improved public transportation, electrification and greater emphasis on education would also be reasonable expectations.

14. Institutional Factors

Honduras is a country where little institutional capacity and experience exists regarding environmental management. Within the public sector COHDEFOR and RENARE have the greatest technical capabilities relating to traditional areas of natural resources management. COHDEFOR (and the country in general) has an abundance of trained foresters at middle and lower levels, but lacks specialized staff with advanced training in specific fields; environmental planning and management is one of those fields. Only one private conservation organization with well trained, respected members exists, the Honduran Ecological Association (AHE). In order to fulfill the country's needs for improved environmental management, both training and additional financial and human resources are needed.

Alternative A provides both resources and opportunities for further development of environmental expertise within COHDEFOR and the AHE. (Both ESNACIFOR and CURLA the two institutions where almost all Honduran foresters are trained, have courses related to ecological issues, e.g. wildlife, ecology, forest protection, watershed management, forest soils, etc.). Financial resources provide for appropriate short-term training by the national forestry school, ESNACIFOR. ESNACIFOR is respected regional school with recognized capabilities in forestry and general natural resources management. Short term technical assistance in environmental management will be provided to ESNACIFOR, as needed, to carry out the environmental assessment/mitigation training required by the project. Twenty thousand dollars in grant funds are provided to meet these needs. AHE is assigned $100,000 for environmental education and technical assistance to the private sector in environmental assessment for forest management. Forty thousand dollars in GOH local currencies are allocated to ESNACIFOR and the National University for applied research in the environmental problems of logging, wildlife and wildlands management/protection in FMUs, and for other identified needs.

CODEHFOR, as the lead institution, must play a major role in developing technical guidelines, and regulating and controlling forest management activities to assure environmental soundness. Some short and long-term technical assistance is provided to assist COHDEFOR in its new role but much of its technical staff must be trained and "retrofitted" to do the job. Although establishment of separate environmental section is COHDEFOR is not contemplated, the institutions traditionally high concern for environmental issues is well known, and a permanent high level COHDEFOR staff member with ample broad experience in natural resources and environmental management will be assigned to the project, to assure compliance with and implementation of the environmental actions outlined in this E.A.

The "No Action" Alternative does not actively promote pine forest management in selected FMU and throughout the country and so cannot be directly criticized for any failure that may result. On the other hand, it does not take advantage of the opportunity to strengthen forestry in Honduras.

15. Potential Conflicts with other Projects, Institutions and Actions

As described in Section V of this E.A. several possible sources of conflict exist for the FMU of La Union. These potentially could have more effect on the success or failure of Alternative A (i.e., meeting FDP goal and objectives) than the design and implementation of the La Union Forest Management plan itself. This situation is probably typical for most any selected FMUs. It is recommended that during the implementation of the preferred alternative (if this occurs) close attention should be paid to these external activities and actions should be taken in a timely manner to avoid negative consequences.

232

II. PURPOSE OF AND NEED FOR ACTION

Purpose and Nature of Action

The following section gives an historic overview of environmental problems related to the forestry sector in Honduras. This summary is largely extracted from the Honduras Country Environmental Profile (AID, 1981) and is intended to give a perspective to the unfamiliar reader and set a backdrop for the recommendations of this EA. It gives a picture of the problems of the forestry sector prior to the concept of the COHDEFOR-AID Forestry Development Project.

Forestry in Honduras - An Overview

Honduras is the only Latin American country in which forestry is one of the principal economic activities. Lumber ranks in value among the top five exports of the country. The prime factor contributing to the importance of forestry is the presence of some three million hectares of pine and 2 million hectares of broadleaf (4.4. million of broadleaf in 1964). Historically, poor upland soils and broken topography have limited competition for land from agriculture and to some extent from cattle grazing.

While mahogany and cedar are esteemed abroad, little effort has been made to create markets for other hardwoods with valuable properties because of the ease of exploiting and marketing pine. Consequently pine constitutes 97 percent of the value of all lumber exported. Hardwoods remain an under-utilized resource rapidly disappearing as forests are burned and converted directly for agriculture and grazing. Furthermore, the majority of high value pine forests have been exploited or degraded and only an estimated 400,000 hectares of primary pine forest remain. Due to insufficient effort in forest regeneration and management, the majority of Honduras' pine forests now are found in a degraded state of reduced productivity.

Constraints to Forestry Development

Unlike agriculture which is limited by a scarcity of appropriate land, there is an abundance of land suitable for pine and hardwood production. The contribution of forest products to the export economy and to the well-being of the rural population is limited by the interaction of four broad constraints operating within the institutional and cultural structure of Honduras which are briefly discussed below. Environmental problems, such as uncontrolled fire, deforestation, and erosion, affect the productivity of the forestry sector as well as that of agriculture, energy, and fisheries, and foreclose opportunities for other types of non-traditional development such as tourism.

Economic Participation of the Campesino

An estimated 200,000 families live within the limits of the forest areas managed by COHDEFOR. Traditionally, these people have received minimal benefit from the exploitation of the forest that surrounds them and therefore have had little incentive to conserve and manage forest resources. The

reasons are, first, the State, not the individual campesino or his village, is the owner of the timber; and second, most campesinos lack proper identification papers and therefore are not employed by COHDEFOR. COHDEFOR sells the standing timber to an outside concessionaire who cuts the wood and resells the lumber back for export.

Logging Practices

Logging is marked by waste and inefficiency at every step, from the stump to the mill. In the cutting of broadleaf forests, only about 10 percent of a given stand is normally utilized, the focus being on only a few particularly valuable species such as mahogany. In both pine and broadleaf areas logs with defects are abandoned, variable lengths result in wasteful trimming, and poor sawing practices and poorly maintained equipment contribute to the loss of as much as 50 percent of the potentially marketable wood. Lower grade wood with a potential local market is left in the forest or burned at the mill. There are insufficient operational standards and procedures governing what slopes and soils can be logged without incurring site degradation, or where and how logging roads should be constructed.

Forestry Knowledge

Failure to place a value on the resource has led to its destruction by competing activities of relatively low value, namely shifting agriculture and grazing. Even in the pine forests sustained yield forestry has been lacking. Insufficient forest protection and management and weak forest industries have led to the accelerating loss of pine forest resources.

Institutional Functions

Honduras has centralized, under State control, not only such traditional functions of a forest service as protection and extension, but also the ownership and management of all trees, and the commercialization of domestic and exported of forest products as well. The objective of taking over most private sector functions is to generate funds directly for the public treasury through rational management of the total resource. In reality, a powerful but unwieldy bureaucracy has arisen with neither the business sense of a corporation nor the esprit de corps of a national forest service. COHDEFOR has been plagued by problems of essential coordination among departments such as production and commercialization. Social forestry, an official concern for the large population living in or peripheral to the forest, has not been taken seriously. For example, the volume of firewood cut by campesinos is five times the volume of wood exported, yet this major forest use and contribution to the economy is given low priority by COHDEFOR.

Environmental Problems

Fire

The high incidence of uncontrolled forest fires limits the benefits that could accrue to campesinos from utilization of pine forest resources. Since those

who live in the pine forests do not benefit from its optimum management, they tend to use fire inappropriately. Fire is used to prepare a new field for cultivation and often escapes to surrounding forest land. Similarly, cattle operations burn pastures annually to maintain palatability of grass for the cattle and to control ticks and chiggers. Some fires are set out of spite because COHDEFOR has usurped campesinos' forest. Between 1977 and 1981, illegal fires burned on the average 65,000 hectares per year, with an estimated timber loss of 448,000 cubic meters per year. The total effect of ill-timed and frequent fire is a loss of standing timber and a great loss in pine regeneration that in turn, affect future timber harvests. Efforts have been made to improve fire detection and control. However, the underlying issue of full participation by the campesino in the forest economy has not been addressed effectively.

Erosion

While erosion caused by logging operations is not of the same magnitude as that due to shifting agriculture, it is significant. Skid trails and roads that are poorly designed or situated trigger serious erosion. Where logging is extended into steeply sloping marginal areas in upper watersheds, the inevitable invasion of campesino farmers using the forest roads and trails greatly exacerbates the problems of erosion and downstream sedimentation. Lack of a social forestry program to involve the campesino in forest product exploitation, and total neglect of the small, hillside farmer by the agricultural sector guarantee an unstable situation characterized by serious erosion, forest degradation and institutionalized poverty.

Watershed Problems

The Honduras Country Environmental Profile (H/CEP) gives an excellent overview of watershed problems in Honduras and summarizes the problems that have occurred in the Aguan River in recent years. Also, a summary of the experiences of the FAO Watershed Project carried out in the area is quoted, as follows:

QUOTE: - "RENARE estimates that the value lost to erosion and loss of soils and flooding in the Aguan River and Atlantic litoral watersheds is in excess of 4.5 million dollars per year, a figure which is considered very low because it does not include all watersheds.

- Floods in the Atlantic litoral region in 1976 caused an estimated 1.3 million dollars of damage to roads and houses in the La Ceiba area. The same year, floods in the Aguan river valley caused 1.7 million dollars damage to infrastructure and extensive damage to commercial crops." (page 93, H/CEP) (2).

"Integrated Rural Development of the Bajo Aguan Valley Region

Project Description: This project, initiated in 1979, is primarily funded and executed by UNDP, involving CONSUPLANE as the counterpart executor. The objectives of the project are to:

- increase knowledge of the natural and human resources of the area;
- establish a regional planning system for purposes of the study and development of the region;
- coordinate government agencies working in the area as dictated by the regional and national plan; and
- increase investments in the region within the framework of the plan, thereby assuring productivity of the program.

Specific sub-projects include: studies for a system of dikes for flood control; dams for flood control, irrigation, and electrical energy production; regional and urban development studies and plans; and a watershed management plan (soil and water resources management). The project area includes that of the Aguan Valley, the location of the largest agrarian reform project coordinated by INA. The watershed management component has involved the preparation of maps related to drainage, land use, topography, which allows the comparison of actual and ideal land use. A diagnosis for future studies and management plans are also included.

Critique. Emphasis in the project has been given primarily to costly infrastructure to control floods within the valley instead of the upstream areas of the watershed where shifting agriculture and deforestation are exacerbating an already serious flooding situation. The watershed management component in the upper stream segments should be given an equal if not higher emphasis in the project." (page 99, H/CEP) (2). UNQUOTE.

Loss of the Forest Resource

The basic institutional failures by the forestry and agricultural sectors to recognize the survival needs of the campesino, particularly his need to benefit from the management of the forest around him, underlie the precipitous loss of forest resources in Honduras. The pine forests are not decreasing markedly in area, but the volume dropped from 48 to 28 million cubic meters between 1964 and 1980. Much of this drop in volume is due to poor regeneration caused by uncontrolled burning. If the human problems underlying burning are not resolved, commercial logging based on cutting the remaining old growth pine will virtually stop in the next 10-15 years.

226

The Role of the FDP Vis a Vis Environmental Management

Most of the environmental problems mentioned in this overview are not new; they have existed and been recognized for years in Honduras. One of the principal objectives of the Forestry Development Project is to attend to these forestry related environmental problems by stimulating a strong and healthy forest industry and increasing pine forest management capability.

The project, given its goal, purpose and design, faces two major challenges from the environmental point of view: the first is to reorient COHDEFOR to allow it to regulate and promote environmentally sound forest management. In order to do this, COHDEFOR will have to improve forest management practices and upgrade the level of its technical staff. Technologies and experience for forest road construction/maintenance and logging practices are two of the major areas where deficiencies occur. Second, COHDEFOR must integrate forestry and conservation with rural development. The sustainability of the La Union pilot experience hinges on COHDEFOR's ability to evoke and control the participation of the campesino and rural landowner in forest management, and to protect other resources associated with forests (soil, water, wildlife, wildlands) that are essential for sustained rural development.

GOH Forestry Development Strategy

The Government of Honduras' objectives for the forestry sector are:

-- to assure the sustained flow of products from the forest while increasing its productivity and incorporating the rural population in the benefits; and

-- to increase the value of forest product exports.

To achieve these objectives, the GOH has formulated a two-part strategy. The first part of this strategy is to augment the capability of COHDEFOR to manage the resource and guarantee that utilization of the forest is carried out in a rational manner. To this end, the focus of COHDEFOR has been altered. COHDEFOR has relinquished much of its prior responsibility in forest industries and marketing to concentrate on the management of the forest resources. COHDEFOR has elaborated a document that indicates the policy, strategy and main actions it plans to carry out from 1986 to 1990.*

The organization and budget of COHDEFOR is being adjusted according to the new orientation of the institution. Consequently, the district offices of COHDEFOR have been given greater authority and now depend directly from the Office of the General Manager. In response to greater involvement of the private sector in export of lumber, the functions of the Commercial Department have been changed to emphasize control and documentation, rather than direct marketing as was formerly their responsibility.

To incorporate the rural population into forestry activities, the centerpiece of the strategy is the delimitation of forest areas into Integrated Management

237

Areas (AMIs). In these areas, of between 1,000 and 10,000 hectares, the protection management and utilization (including logging) will be carried out by the local community with the guidance of COHDEFOR technicians. By 1990, 450 of these AMIs are supposed to be functioning.

The second part of the GOH strategy centers on revitalizing the forest industry through a significantly enhanced participation of the private sector in production and export. The National Development Plan foresees a 4.9 percent annual growth rate for the forestry industry sector, due primarily to increased efficiency of the primary and secondary industry.

The first step in implementing this portion of the strategy was taken with the adoption by the GOH of several policy measures in 1985. Principal among these were decisions to pass to the private sector complete responsibility for timber processing (i.e., logging and milling) and marketing. This transition requires the divestiture of COHDEFOR owned forest industries, a process which has already begun and which will continue for the next several years. The new strategy also requires that COHDEFOR give up the direct export of lumber and encourage competition among private sector firms to export. Important advances have been made on this task, and an improved system is functioning. However, this system will still need to be refined.

In summary, Alternative A proposes to respond to the needs of the GOH Forestry Sector by the following major areas of action:

1) Stretch out the timber resource.

Recognizing the impending depletion of commercial pine forests in the next 15 years, the strategy is to modernize and increase the efficiency of timber production (logging, sawmilling, and marketing) to produce the same amount of lumber with less stumpage and pine forest cut per yea The result would be to sustain the current woods products industry, (an estimated 30 years) avoiding economic hardship and giving time for secondary forest regeneration.

2) Renew the pine forest resource

Through improved forest management (including planning, forest protection, forest harvest, silviculture and social forestry) regenerate and revitalize the commercial pine forest resource.

3) Reorient and support COHDEFOR.

Through training, technical assistance and financial resources, COHDEFOR will be reoriented to better execute its redefined role of managing and protecting forest resources, assisting the private sector in lumber processing, and establishing the norms for and supervising the process of lumber marketing.

4) Strengthen the Private Sector.

Enhance the private sector's capability to more efficiently and soundly (technically and environmentally) accomplish lumber production. The provision of a healthier policy environment, credit, training and technical assistance will be the means to accomplish this.

5) Improve Forest Management in Concert with Environmental Protection.

Improve forest management capabilities, both public and private, and public awareness, to better accomplish the conservation of forest resources and environmental protection.

CONTENTS OF ENVIRONMENTAL ASSESSMENT

This Environmental Assessment is prepared in response to the proposed Forestry Development Project which the Agency for International Development Mission in Honduras has prepared jointly with the Government of Honduras. The decision to be made is which of the two alternatives evaluated in this document will be implemented. This decision will be made following USAID review and comment on this document. The procedures for preparation and review of this E.A. are based on USAID's environmental procedures (22 CFR Part 216). Approval of one or the other alternative analyzed in this E.A. should occur in accordance with both this USAID regulation and a recent FAA amendment, Section 118. (U.S. law regarding the protection of tropical forests).

This E.A. describes, in general, the affected environment and the environmental consequences of implementing each of the alternatives. At the time of the assessment, only one of three potentially affected Forestry Management Units - La Union - had been selected and could be analyzed at the field level. Given the fact that the concept and intent of action in the FMU's is clearly understood, approval of the project by AID/W would be based upon compliance with a condition precedent requiring additional environmental review of the forest management component after authorization of financing, per Section 216.3 (a) 7 of USAID environmental procedures (see Section VI - Mitigative Measures, Project Conditions and Covenants). Thus, additional analysis and review would be carried out for all three FMUs once detailed Forest Management Plans are developed and presented to USAID/H for approval.

The environmental analysis for the comparison of impacts by alternatives contained in this document was conducted by an interdisciplinary and interinstitutional team, and the physical, biological, social and economic factors pertinent to the decision have been considered in a comprehensive, interdisciplinary manner.

ENVIRONMENTAL ISSUES

The E. A. scoping team identified insufficient analysis and information in the I.E.E. in four principal areas. These issues will be addressed in greater depth in this E.A.:

Based on the results of the IEE, E.A. scoping exercise, and the professional judgment of the specialist/interdisciplinary team that participated in this environmental assessment process, the following seven criteria were established in their order of importance, as the basis for alternative evaluation:

1. Tropical Forest Depletion

2. Conservation of Biological Diversity

3. Socio-Economic Benefits

4. Timber (commercial pine forests)

5. Physical Environment and Downstream Impacts

6. Land Use Stabilization and Colonization

7. Institutional Feasibility

COOPERATING AGENCIES

The Agency for International Development is the lead agency for the development of this E.A. The United States Forest Service was a cooperating agency and its international forestry division via the Forestry Support Program (FSP-FEUR) assisted in scoping and evaluation. The GOH participated in the development of the Initial Environmental Evaluation for the project as well as in scoping and E.A. evaluation. GOH participating organizations were COHDEFOR and the Ministry of Natural Resources. Finally, the private Honduran Ecological Association (AHE) participated throughout and was responsible for developing a technical report that served as the basis for the IEE and identification of impacts and mitigative measures.

III. ALTERNATIVES

The alternatives section is the core of the E.A. This chapter consists of: (1) the development of alternatives and identification of alternatives not considered, (2) a description of the two alternatives in detail, (3) an evaluation of the alternatives, and (4) the identification of the preferred alternative.

Development of Alternatives and Alternatives not Considered

The alternatives being considered in this E.A. are the "action" alternative (A) which is the implementation of the FDP, and the "no action" alternative (B) which is continuation of the existing situation.

Interdisciplinary technical analysis and the identification of process criteria related to the problems of the forestry sector in Honduras were used to help form the "action" alternative of this E.A. The criteria for alternative A formation were provided by USAID management and technical specialist/consultants, and follow the standard norms and regulations of USAID project design. These criteria included: social, institutional/administrative, economic/financial, technical, environmental and legal feasibility. The particular mix of components and actions that resulted came from interdisciplinary team work and analysis.

The FDP Project Alternative (A) focuses on addressing the identified environmental issues and opportunities, and was designed following USAID environmental policy and regulations.

Options Within Alternatives

It is recognized that in considering the possible amenities and minor component actions of a complex project such as the FDP, the alternatives are limitless. During project implementation minor actions can change but the major components and actions will remain as described in the authorizing documents. This Alternative A as described, will provide a reasonable concept of development for analysis purposes. The following are some of the actions left as options within the stated Alternative A:

1. More protective types of logging systems such as jammer, high lead or skyline;

2. Harvest treatments: regeneration and seed tree cuts; thinnings;

3. Prescribed burning, supervised by a COHDEFOR certified forester;

4. Scarification treatments, if done manually and by local labor;

5. Fire towers and their access roads, properly constructed and controlled;

6. Bark beetle control measures (excluding pesticides);

7. Forestry camp and field constructions.

The impacts of these options within Alternative A are minor when compared to overall impacts of development, logging and roading. Impacts of these and other possible options of management will be evaluated and approved as part of the forest management plans, not in this E.A..

Alternatives Not Considered

This E.A. is specific to an application for forestry development and management as described in the USAID Project Paper (6), and will not consider the following alternatives/actions (without further environmental assessment and review):

1. Pesticide procurement and use;

2. Clearcut logging;

3. Direct colonization/resettlement;

4. Other extractive uses of natural resources in the FMUs, such as mining;

5. The construction of dams or other substantial water control structures;

6. Major agricultural developments (land leveling, drainage, mechanization);

7. Major agroindustrial development;

8. Potable water and sewerage works.

Also, as a result of the in-depth analysis performed for this project, including a PID, 14 consultant reports, and the "Report of the U.S. Presidential Agricultural Mission to Honduras", November 1982. (18), the following alternatives were not considered:

1. FDP without the stumpage/valuation component;

2. FDP without credit for private industry;

3. FDP without forest management in selected areas;

4. FDP without forest reserves/protection.

24

Also, a pure forest protection project was discarded as being socio-economically and financially unrealistic/viable.

Alternatives in Detail

Listed below are descriptions of the components and actions of the "Action" and "No Action" Alternatives.

Alternative A involves the implementation of the Forestry Development Project. Regarding the "Forest Management in Selected Areas" component of Alternative A, exact management practices, location and design specific for each FMU would be established later and proposed in a detailed forest management Plan (FMP). A condition precedent to additional disbursements of funds for that component requires environmental review and approval of these FMPs. An illustrative description of actions for the La Union FMU is given to indicate the concept and nature of the forest management component and the type of planning, analysis, implementation and control that would be exercised for the La Union and future FMUs.

Alternative B would continue present management and development with no FDP implementation nor inputs. This analysis assumes selection and enactment of an alternative starting in 1988, and, in the case of Alternative A, project activity thru 1995. Alternative A involves the implementation of a forest management plan in two selected areas and the identification of a third area for prefeasibility studies.

Area I (La Union) would be planned for implementation during project year 1, followed by review/approval of the FMP and implementation. The same sequence is scheduled for area II starting in project year 4. Pre-feasibility studies, including an environmental assessment, will be carried out for area III during the last year of the project but no funding will be provided for development of the third area. If Alternative A is selected, no further development beyond prefeasibility studies would be allowed in area III.

Alternative A (Implementation of the Forestry Development Project 522-0246)

Management Action

This alternative involves implementation of the Forestry Development Project with three principal components and sets of outputs, outlined in Table No. 1.

The existing facilities specific to the La Union FMU are described under Alternative B (below)

Development Schedule: Life of Project (1988-1995)

Alternative B (No Action)

Table 1: FDP Outputs and Verifiable Indicators (cont.)

Project title and number: FORESTRY DEVELOPMENT PROJECT (522-0246) Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS
Sector Goal:	Measures of goal achievement:
To contribute to the value of agricultural production through sustainable levels in production and exports derived from the forest sector.	- A 7% increase in forestry sector wood production by PACD, 1994. - Wood and wood products exports sustained at the present rate of 121 million board feet per year
Project Purpose:	Conditions that will indicate purpose has been achieved: End of project status
To improve the management and sustainable productivity of commercial pine forests and the efficiency of industrial conversion and marketing of wood product.	1. COHDEFOR has relinquished all industrial operations. 2. COHDEFOR's financial situation is stabilized with adequate income to cover costs. 3. All timber transaction carried out in accordance with rational forest management plans. 4. Forest utilization carried out in accordance with allowable cut. 5. Industry able to utilize profitably a wider range of timber resources. 6. Sustainability of pine forest management measured by acceptable level of regeneration and the implementation of environmentally sound logging and forest management practices.
Outputs:	Magnitude of Outputs:
A. Institutional reorientation of COHDEFOR	
1. All industrial scale sales of pine timber in Honduras made using stumpage sale and valuation system and logged according to timber sale regulations.	1.a. Trained, equipped crews carrying out inventories for timber sales in all management units in which commercial pine timber is being cut. 1.b. All commercial pine timber sold on stump through sale contracts according to procedures developed by project. 1.c. Environmental procedures, including technical guidelines for road and trail construction/maintenance and logging practices, incorporated in all sale contracts.

244

Table 1 (continued)

Project title and number: FORESTRY DEVELOPMENT PROJECT (522-0246) Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS
2. All lumber export handled and negotiated by private sector with appropriate monetary benefit accruing to national government.	2.a. COHDEFOR no longer handles lumber or other products for export 2.b. COHDEFOR no longer involved in direct negotiations for export of lumber 2.c. All export of lumber carried out according to clear, public and impartial guidelines 2.d. All export of lumber and wood products monitored by COHDEFOR
3. COHDEFOR covering its operational costs and functioning efficiently according to modern, appropriate operating procedures.	3.a. COHDEFOR's operational costs do not exceed revenues derived from stumpage charge and export commissions. 3.b. Management manuals being used to guide operations 3.c. Accounting system functioning according to generally accepted professional standards 3.d. Objectives established for each office and division 3.e. Objective requirements established and reinforced for all positions in COHDEFOR. 3.f. System of performance evaluation based upon objectives, in operation for both institutions and personnel.
B. Forest management of selected areas	
4. Forest management plans for la Union, AREA2 and AREA3 completed and operational.	4.a. Planning document meeting standards for intensive pine forest management plans. 4.b. Detailed annual work plan and budget based on management plan, approved by COHDEFOR.
5. La Union and AREA2 forests protected against damage from wildfire, grazing, land clearing and pests.	5.a. Four fire towers constructed and manned during fire season. 5.b. Less than 2% of the area of regenerating forest is burned annually by wildfires 5.c. All campesino groups that are deriving income from forest, assisting in detection and combat of wildfires. 5.d. Illegal land clearing of managed pine forest eliminated by fourth year under management 5.e. Regular terrestrial and aerial detection of pests under way according to control plan. 5.f. All detected pest outbreaks being combatted by proper control techniques. 5.g. Two wildland areas decreed and protected in La Union 5.h. Watershed management carried out on those watersheds supplying local communities
6. Forest road system in La Union and AREA2	6.a. Secondary forest roads = 63km

Table 1 (continued)

Project title and number: FORESTRY DEVELOPMENT PROJECT (522-0246) Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS
expanded and upgraded according to the levels indicated in the forest management plans.	constructed by loggers according to specifications of timber sale contract 6.b. Skid trails constructed by loggers according to specifications of timber sale contract 6.c. All roads and skid trails constructed so as to minimize watershed impacts 6.d. All primary and secondary roads of the forest properly maintained, with respect to watershed management criteria
7. Logged and undestocked sites in La Union and AREA2 regenerated according to management plans.	7.a. Detailed, environmentally sound logging regulations, designed to encourage regeneration as well as for other benefits, are part of all timber sales. 7.b. At least 15 seed trees/ha left on all timber sale areas where natural regeneration is prescribed by management plan. 7.c. Of all areas logged 3 years previously and prescribed for natural regeneration, 70% of the area is adequately stocked with at least 80% of sample quadrats occupied by at least one seedling 7.d. Of all sites prescribed for artificial regeneration, 80% of the area is adequately stocked at age 3 years, with at least 30% survival of planted stock or 80% occupancy of seed spots 7.e. Of all understocked areas prescribed for natural regeneration, 3 years after prescription of intensive protection or treatment, 70% of the area is adequately stocked with at least 80% of sample quadrats occupied by at least one seedling 7.f. All logging practices appropriate to site conditions and carried out in an environmentally sound way
8. Local population in La Union and AREA2 deriving significant and sustained income from forest based industries and activities.	8.a. Twenty campesino groups in La Union and 10 in AREA2 deriving significant income from forest. 8.b. Equivalent of 700 full-time forest based jobs created in La Union and 300 in AREA2 8.c. Viable, campesino operated forest industries based on use of logging residues and of trees too small to extract to sawmill 8.d. Animal logging in use on all timber sales where terrain, log size and availability of animals permits. 8.e. All routine road maintainance contracted to local inhabitants whenever their availability permits. 8.f. All silvicultural operations (planting, thinning, etc.) contracted to

24

Table 1 (continued)

Project title and number: FORESTRY DEVELOPMENT PROJECT (522-0246) Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS
	local inhabitants whenever their availability permits.
9. Agricultural and grazing practices in La Union and AREA2 improved and harmonized with forest management.	9.a. At least 1200 campesinos producing agricultural commodities on 2400 ha of land improved with soil conservation in La Union by PACD, and half as much in AREA2. 9.b. Of those participating farmers producing less than 4000 lb of corn/mz 75% have had production raised to 5000 lb/mz. 9.c. Of those participating farmers producing less that 1300 lb beans/mz 75% have had production raised to 1600 lb/ms. 9.d. Of those farmers owning less than 20 head cattle, 75% are meeting forage needs during half of the dry season with supplements from improved pasture, rotation grazing, cut-and-carry grasses, etc. 9.e. Income from animal husbandry maintained at current level or increased but with reduction in herd size to one half.
C. Strengthening of forest industry	
10. Better utilization of standing timber volume through economically sound and technically efficient logging and residue use.	10.a. All trees greater than 14 inches d.b.h. are harvested for sawmills, unless reserved for seed trees or other purposes. 10.b. Trees felled and bucked for maximum utilization according to correct practices outlined in published guidelines. 10.c. All commercial standing volume included in timber sales utilized by Year 3 (in contrast to present practices of leaving 20% wasted) 10.d. Sawmills receiving logs at more constant rate, so that down time caused by lack of logs is reduced to half of present downtime
11. Greater efficiency of sawmills.	11.a. Sawmills utilizing logs down to minimum top diameter of 6 inches. 11.b. Lumber recovery increased from the present average of 191 bd.ft./m3 to 245 bd.ft./m3 by PACD, for all sawmills assisted 11.c. Thickness of boards within 1/8 inch tolerance, for all sawmills assisted. 11.d. Lumber processed by band sawmills increased from present 60 % to 90 % of all lumber produced by PACD. 11.e. Downtime of primary breakdown saws decreased by 25%, for all sawmills assisted

Table 1 (cont.)

Project title and number: FORESTRY DEVELOPMENT PROJECT (522-0246) Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS
12. Financing available to viable primary forest operations and industry for improvements leading to greater efficiency and environmentally sound practises	12.a. At least 30 forest industries have received loans for at least $5 million and have applied them to improve efficiency. 12.b. All credit being allocated according to feasibility studies which include environmental guidelines. 12.c. All credit used according to credit agreement. 12.d. Repayment delinquency less than ... %

Management Action

Alternative B is the "No Action" Alternative with current COHDEFOR management activity and programs for the La Union FMU are described in the following paragraphs. It is believed that the La Union area is representative of the other FMUs that would be effected by the alternatives being considered in this E.A.

The La Union FMU is located in the northwestern portion of the Department of Olancho, in north central Honduras (see maps 2 and 3). The FMU covers four municipalities: La Union (partially), El Rosario, Mangulile and Yocon, and has a total area of 100,800 hectares (1,008 km^2).

The La Union unit is within the Olancho National Forest Reserve and is a COHDEFOR forest management unit, although no substantial development activity has been carried out in recent years. The area had a rural population of 20,183 inhabitants as of 1984 and currently has a mix of land uses including (rural) residential, agricultural, grazing and unmanaged forest. COHDEFOR has carried out a program of protection in recent years but resources have been scarce and activity has been limited principally to fire protection and prevention of illegal cutting. Land tenure, based on the most recent cadastral survey (1968), was 28% private, 5% municipal and 67% national lands. Forest cover, based on national forest inventory (INFONAC) information from 1980, is: 44.6% pine (4.6% young and 40% mature and over mature), 6.1% mixed forests (pine and broadleaf, generally with predominance of pine), 21.3% broadleaf forests and 27.9% agricultural and other uses. Population has been relatively static in recent years. Principal agricultural activity centers on basic grains (corn, beans and some rice), extensive grazing (20,303 head equivalent to 1 head per 5 hectares) and coffee production. In general, the area is typically rural with poverty (low income and employment), poor health and public services, and insufficient economic opportunity and GOH attentions.

Comparison of Impacts by Alternative

Issues to be analyzed in this E.A. were identified in an Initial Environmental Examination (I.E.E.) and expanded upon in an environmental scoping exercise (see cable 87 Tegucigalpa 010581 and STATE 87-205318). The I.E.E. evaluated impacts related to: soil and water (approximate) downstream environments, timber and forest resources, biological diversity, wildlife and wildlands, human inhabitants, and cultural and archaeological resources. This combined set of issues, along with the technical/professional judgment of the specialists who worked on the assessment was the basis for forming the "evaluation criteria", which are measures used for evaluating the two alternatives and identifying a preferred alternative. Alternatives A and B were evaluated by comparing present and future socio-economic, and environmental conditions and trends, as defined by these criteria. The relative importance of each evaluation criterion was based upon several factors: 1) I.E.E. and E.A. scopes and analysis; 2) historical conditions regarding forestry and environment in Honduras and the La Union FMU; and 3) legal, regulatory (FAA and 22 CFR 216) and management concerns of USAID.

249

Weighing the magnitude of effects and the importance rating of each evaluation criteria indicates which alternative would provide the best balance towards meeting all evaluation criterion. This section outlines the process of evaluation used. Each evaluation criterion, with the respective issue statement, follows, with comparisons of how the alternatives meet the particular criterion.

Evaluating the Alternatives

Evaluation criteria include biological and physical environment, socio-economic, land use and institutional criteria. The variables, or measures, selected as indices for criteria were kept to the minimum number necessary. Numerous mitigation measures have been identified and considered, many of which attend to the minor variables not mentioned in this chapter. These are listed and discussed in Chapter VI.

Based on the results of the I.E.E., E.A. scoping exercise, and the professional judgment of the specialist/interdisciplinary team that participated in this environmental assessment process, the following seven criteria were established in their order of importance, as the basis for alternative evaluation:

1. Tropical Forest Depletion
2. Biological Diversity
3. Socio-Economic Benefits
4. Timber (commercial pine forests)
5. Physical Environment and Downstream Impacts
6. Land Use Stabilization and Colonization
7. Institutional Feasibility

Evaluation Criterion: Tropical Forest Depletion (measures the degree to which the alternatives contribute to the conservation of the total tropical forest resources (broadleaf plus pine). Rated the most important criterion.

Issues:

1. What will be the effect on the conservation and sustainable management of tropical forests? Specifically, what will be the effects on convertion of pine and broadleaf forests to other uses?

2. What will be the effect on the regeneration of degraded tropical forests? Specifically, how many hectares of degraded forests can be expected to be reclaimed?

Assumptions:

1. Forest protected or regenerated would not be destroyed by catastrophic fires, hurricanes or other events;

2. Continued stability of democratic GOH and COHDEFOR;

3. Tropical forests play an essential role in socio-economic development and environmental stability;

4. Other non-FDP actions in FMUs will be able to be controlled to avoid major counterproductive effects.

Summary of Conclusions

Alternative A provides a reasonable assurance that the tropical broadleaf forest serving important ecological functions in the area of influence of commercial pine stands in FMUs will be permanently protected and properly managed. The GOH will sign a presidential or congressional decree assigning these reserve areas a permanent protection status as biological-hydrological reserves. Riparian forests, excessively steep pine forests and portions of critical watershed areas within FMUs will also be managed and/or protected. Degraded pine forests within selected FMUs will be regenerated and managed. Likewise, Alternative A provides a reasonable assurance that commercial pine forests in the selected FMUs where the project is operative will be managed on a sustainable and environmentally sound basis.

Alternative B does not offer resources nor some assurance that the tropical forests in La Union and other candidate FMUs in Honduras will not continue to be exploited and degraded in the traditional manner. The probable results of no action are that the commercial pine forest of those FMUs would be highgraded and inadequately protected from fire and grazing. Traditional practices would not allow for the protection of other non-commercial forests. Conversion of these areas into agricultural uses would be accelerated.

Evaluation Criterion: Biological Diversity (measures the degree to which the alternatives contribute to the conservation of biological and genetic resources). Rated the second most important criterion.

Issues:

1. What will be the effect on the conservation of wildlife, fisheries and rare or endangered species? Specifically are there wildlife species present and will they be managed for? Are there rare or endangered species and will they be protected?

2. What will be the effect on the protection of unique natural areas with abundant biological/genetic resources? Will biological reserves be established and protected?

Assumptions:

1. That the GOH and local inhabitants will want to continue to protect natural areas after PACD;

2. That proper habitat management and/or protection will be a major positive factor in the species preservation. Wildlife evaluation was generally based on habitat changes which affect species composition and abundance on forest/wildlands.

251

Summary of Conclusions

In general, wildlife, fisheries (more frequently off-site) and rare or endangered species considerations will be important for most forest management units/operations in Honduras. Using the La Union FMU as an illustrative case, both wildlife and rare and endangered species occur and are currently under pressure from uncontrolled hunting and harvesting for sale. On-site fisheries are not known to be important but the downstream impacts could affect wetlands and coastal resources in the lower Aguan Valley.

Alternative A would introduce wildlife management practices and would protect the species-rich highland broadleaf forest. Furthermore, the protection of native riparian vegetation in logging areas, the management of community watersheds (with even more strict logging regulations) and the reservation of steep pine lands (where traditional logging would not be permitted) would provide islands and corridors of native habitat where wildlife, rare and endangered species would be protected and allowed to migrate. Watershed management and environmental controls over logging and roading to reduce accelerated sedimentation will help protect on-site and downstream aquatic organisms, as well as indirectly wetland and coastal resources. Other mitigative measures to protect wildlife resources associated with the pine forest, such as the protection of snags, den trees and feeding areas, forest fire control and habitat enhancement, will be carried out as an integral part of forest management. Wildlife research and inventory work (including habitat assessment) prior to forest harvest will assist in assuring that forest management practices enhance rather than deplete wildlife resources. Alternative A will result in the cutting and conversion of 6,235 has. of mixed hardwood/pine forests in La Union to pine forest. These are stands with 25% or less of broadleaf species. Alternative B would not fund forest harvest operations in FMU and would not increase access via forest roads and trails. On the other hand, no resources would be available to prevent spontaneous settlement of forest lands and socio economic to regulate and mitigate the impacts of traditional logging operations, hunting and other actions that impact on biological diversity. There would be no forseeable reserves or wildland areas established under this alternative.

Evaluation Criterion: Socio-Economic Benefits (Measures basic social change, macro economic feasibility, and economic structure, including local employment and income generation). Rated as the third most important in a list of seven.

Issues:

1. What will be the macro economic effects?

2. What will be the effects on economic stability in FMUs?

3. What demographic and sociological changes will occur in FMU's and will their effect be positive or negative?

Assumptions:

1. Increased employment resulting from economic development in FMUs would have positive effects.
2. Employment numbers naturally effect un/underemployment rates.

3. The alternative with the least seasonal fluctuation in unemployment rates is most desirable.
4. The higher the per capita income, the greater the benefits.
5. There will be increasing negative social impacts with increases in permanent and seasonal population and population densities.
6. The shorter the time span over which population growth takes place, the more negative are the effects.
7. The rate of change in existing social groups is a critical consideration, with higher rates leading to lower stability and greater potential for intergroup conflict.
8. Individuals unable to adapt to change will eventually leave the area.

Summary of Conclusions:

Alternative A shows positive macro-economic effects both in terms of financial and economic profitability. The financial rate of return is 20.8% and the economic rate of return is 21.2%. Thus the project would be justified on both economic and financial grounds. A sensitivity analysis confirmed that the ERR would stay over a minimum threshold of investment profitability in some worse case scenarios. (See: Economic Analysis, Project Paper, pages 79-82).

Alternative A would present significant increases in local employment and income generation. At least 20 campesino groups in La Union and in Area II would derive significantly increased income and employment from forest management. This represents an equivalent of 700 full time jobs in La Union and 300 in Area II. These economic benefits would be derived from campesino owned and operated small-scale forest industries as well as through employment in logging (with oxen), road maintenance, fire prevention and silvicultural practices. Additional socio-economic benefits would be derived from the credit and technical assistance to be provided for improved agricultural and grazing practices.

Alternative A presents opportunities for significant social change. Measures will be taken to control immigration, stabilize land use and concentrate project economic benefits within the current resident population. (See Section V on Land Use and Colonization). In La Union, population increases will occur due to seasonal and transient peoples resulting from the two new regional highways being built, and inmigrants responding to service-oriented jobs. Improved economic situation would result in improved public services and access to the outside world.

Alternative B would present the slowest rate of change. Economic benefits in terms of income and employment generation would be less. Temporary employment would be available as traditional logging moves through the area but not sustained by a long-term forest industry. Population impacts as outlined above would also occur with no provision for stabilization of land use and discouraging colonization.

287

In general, alternative A would introduce the highest rate of change and those unable to adapt would leave the area. Increased economic opportunity, on the other hand, would create jobs and activity and improve public services. It would help to reduce the outmigration of the younger members of the society toward cities.

Evaluation Criterion: Timber (Commercial Pine Forest) (measures the quantitative and qualitative change of pine forests in Honduras). Rated the fourth most important criterion.

Issues:

1. What will be the effect on timber production?

2. What will be the effect on the primary forest?

3. What will be the effect on the quality of the secondary/ regenerating forest?

Assumptions:

1. Policies for private participation in forest product marketing continues.

2. Continued stability of GOH and COHDEFOR.

3. Continued favorable international prices.

4. Installation and acceptance of new stumpage/valuation systems.

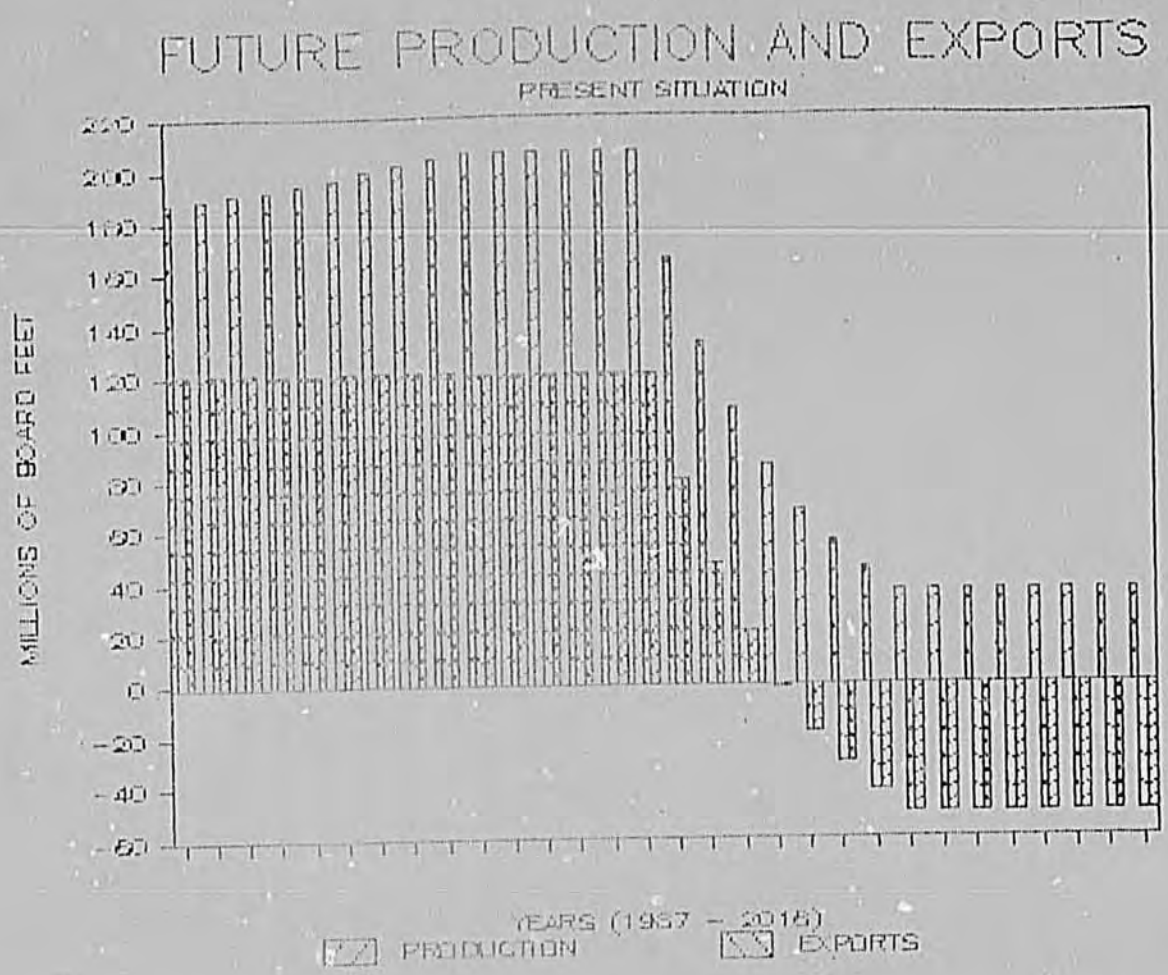
5. Increased efficiency of sawmill industry achieved.

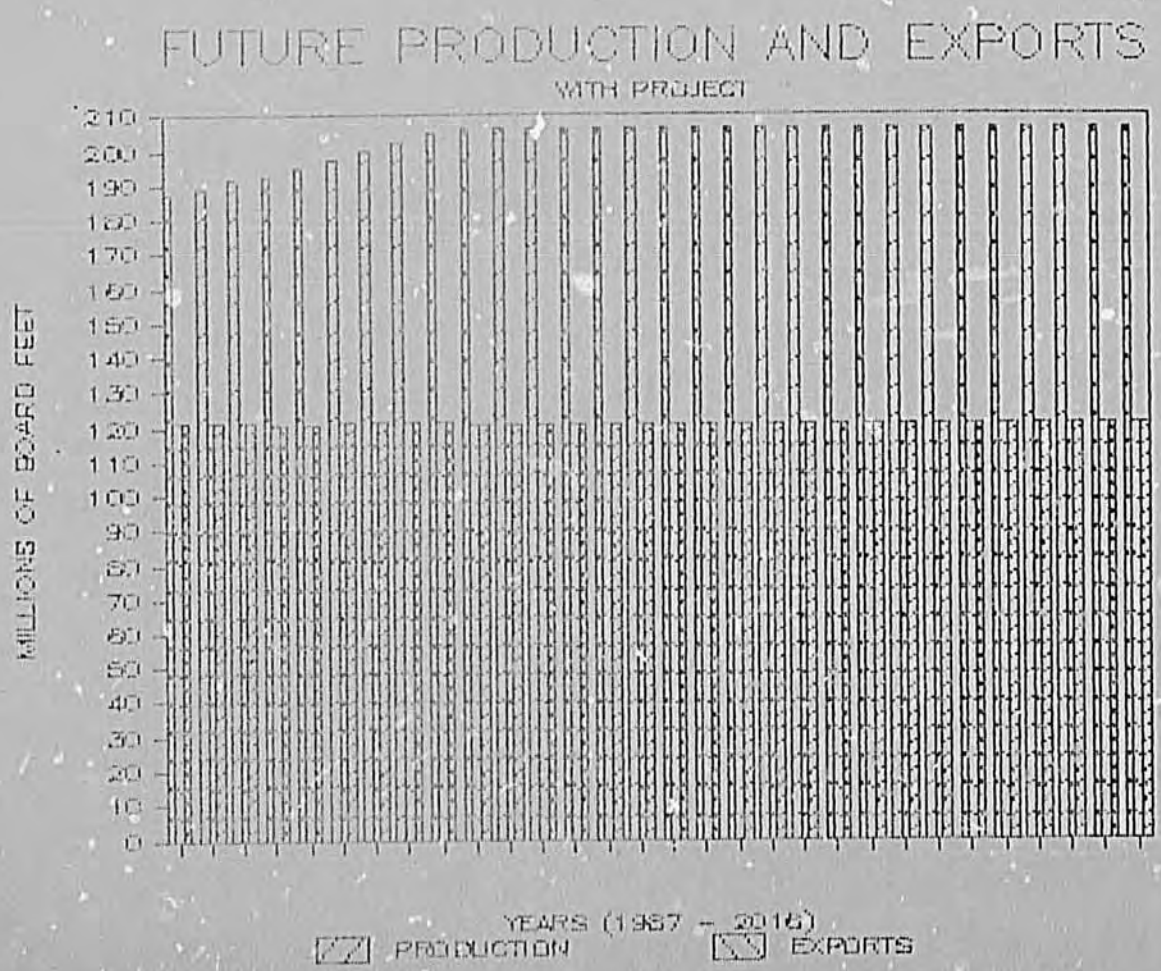
6. Improved forest management practices are accepted by loggers.

Summary of Conclusions

Alternative A would "stretch out" the utilization of the existing primary pine forest from an estimated 15 years to 30 years through the new stumpage and valuation system (which would eliminate part of the waste in logging operations) in the efficiency of sawmills. During the LOP the project would reduce the forest areas being harvested without reducing the amount of sawnwood produced. Projections with FDP estimate total production of lumber rising from 188 (1987) to 208 m.b.f. (1996) and then staying constant thru the year 2018. Exports would remain constant at 190 m.b.f. from 1987 thru 2018. With alternative A, the forest management component would improve protection and silvicultural techniques leading to increases in the yields and health of second growth forests. These benefits would be derived not only in the selected FMUs but nationwide wherever the new stumpage/valuation, sawmill enhancement and improved forest management practices are carried out (see Figure 1)

Figure 1. Timber Production in Honduras, with and without FDP





Alternative B would result in a rise in lumber production from 188 m.b.f. in 1987 to 208 m.b.f. in 1996, this staying constant thru 1990. Then production would be projected to drop drastically thru 1998 to approximately 40 m.b.f. starting in 1992 exports would start dropping from 120 m.b.f. to 0 in 1995 and lumber would have to be imported therein (up to 40 m.b.f.) to meet domestic needs. The initial increase in production would be due to unregulated exploitation that would in a few years exhaust the primary forest reserves. Alternative B would result in the depletion of the primary pine forests in approximately 15 years and would provide no resources or mechanism for secondary forest regeneration.

Evaluation Criterion: Physical Environment and Downstream Impacts (Measures tons of sediment and accelerated erosion for soils, and downstream flooding and water quality impacts). Rated as the fifth most important criterion in a list of seven.

Issues:

1. What will be the effect on soil and water resources? Specifically, how would accelerated erosion, mass movement and water quality be affected on site and in the immediate area of influence of forest management operations/FMUs?

2. What would be the off-site, downstream impacts?

Assumptions:

1. That similar conditions will be present in areas II and III as were found in La Union (i.e., that upland-lowland environmental interactions will be important).

2. Hypothetical thinning and selection/seed tree cuts were assumed to be acceptable management options, as is normally the case in forest management.

3. That it will be possible to protect forests from catastrophic wildfires and that other natural disasters will not occur.

Summary of Conclusions:

Using the La Union case study as an illustrative and representative example, Alternatives A and B will result in negative soil and water impacts, both on and off site. Alternative A will result in dispersed logging and roading impacts from project year 2 on until the entire FMU is harvested (over an estimated 40 year rotation). COHDEFOR pre-feasibility studies indicate that approximately 1250 hectares per year will be cut. Soil disturbance and erosion are unavoidable in forest harvest operations but can be minimized with careful logging and roading practices. Mitigative measures will be required in logging sales/contracts; most of the major measures are indicated in this E.A., section VI. The La Union FMU is known to have a good part of the area

in steep slopes and the four soil series that exist have high erosion potential. Regulations will specify management "so as not to cause significant damage to the (soil and water) resources".

The principal off-site, downstream impact will be sedimentation. Sedimentation will be detrimental in two major ways: as it degrades potable water quality for local communities that are serviced by watersheds in the FMU; and as it effects siltation and flooding impacts in the middle and lower Aguan Valley. Water quality standards would be set up and adhered to for areas being logged. Watershed management would be practiced for community watersheds. Water quality and discharge will be monitored in FMU's in operation.

Alternative B would have a similar short-term impact but much greater long-term water quality and erosion impacts. Unregulated logging would occur in concentrated areas and move ahead with fronts. The small logging concessions in La Union area are already in effect and give an indiction of larger sale, long term impacts. Alternative B would probably result in the logging of the complete FMU and with few or no mitigation measures.

Evaluation Criterion: Land Use and Colonization (Estimates the potential for land use stabilization in accordance with land use capability, and the potential for population increase due to spontaneous colonization). Rated sixth most important in a list of seven.

Issues:

1. What will be the effects of improving and stabilizing land use? Specifically, will forest lands remain in forest, and use of agricultural lands be intensified?

2. How will spontaneous colonization be regulated/controlled?

Assumptions

1. Stable land use in basic accordance with land use capability will help to maximize long-term socio-economic benefits.

2. Excessive inmigration of individuals into an area accelerates social change and competition for limited resources. Frequently spontaneous colonists are unfamiliar with their new environment which can lead to accelerated resource degradation. In general, spontaneous colonization has negative social and environmental impacts.

3. A willingness on the part of the local communities of FMUs to plan for their futures and control growth and colonization.

4. A willingness on the part of COHDEFOR to act on and enforce land use restrictions.

287

Summary and Conclusions

Alternative A presents the greatest risk in terms of colonization impacts, while Alternative B essentially maintains the status quo in FMUs. The increased economic opportunity and activity on a sustained basis developed by Alternative A would encourage the arrival of outsiders. Measures to regulate and decrease spontaneous population growth will be carried out by COHDEFOR and MNR (see chapter V). It is probable, however, that some population growth would occur, and would even be desirable in terms of meeting an increased labor demand.

Alternative A would help to stabilize land use, concentrating forestry and resource management on the Forest lands and agriculture and other land uses in the valleys and bottom lands. Credit and extension practices would encourage an intensification of agricultural and grazing uses on lands more suitable for this use, and without detriment to the forest resource.

Alternative B would present the lower risk in terms of encouraging spontaneous settlement from outsiders. A reduced economic opportunity would continue the pattern of subsistence agriculture and extensive grazine which leads to a gradual degradation of forest resources. The impact of the two new regional highways connecting La Union with the north and west would create a crossroads effect that would in itself have the effect of increasing population and competition for agricultural and forest resources. No measures to stabilize or promote more correct land use would be offered by Alternative B.

Evaluation Criteria: Institutional Feasiblity (measured in terms of the appropriate development role of institutions as well as their willingness and capability to fulfill that role). Least important (seventh) of the seven listed criteria.

Issues:

1. What will be the effect on existing institutions? What role should each fulfill? For forest management this includes principally COHDEFOR, AHE and RENARE.

2. Will these institutions be capable of and willing to fulfill their roles? Will outside assistance be needed and how much? Analysis and discussion will concentrate on environmental protection and impact mitigation as it relates to Forest management (especially wildlands protection, logging and roading).

Assumptions:

1. That the GOH and Honduran private institutions involved with forestry are genuinely interested in promoting the socio-economic development of their country and conserving natural resources.

2. That these institutions, given the proper mix and amount of resources, could fulfill the needed role.

3. That there will be continued stability of the democratic GOH and continued administrative stability within COHDEFOR, RENARE and AHE.

SUMMARY OF CONCLUSIONS

Alternative A proposes a fairly complex set of project implementation and administrative arrangements to accomplish outputs. COHDEFOR's changed role is well defined and justified in the PP; in depth analysis identified the effects of Alternative A on the institution and additional resources needed (see project paper, Sections IV, B and V. B). Specific differences relating to COHDEFOR's capability for impact mitigation for forest management especially logging and roading, have been pointed out in this E.A., Section VI on mitigative measures. An increase in long-term technical staff is recommended in the case of Alternative A and one senior technical specialist, either from USAID/H or from the T.A. team, will be given the responsibility to implement all E.A. mitigative measures. (See page 71, Project Management). Likewise, COHDEFOR will assign a permanent senior staff person over the LOP to see that environmental protection and mitigative measures are carried out.

Alternative A also would require financial and technical resources for the protection of wildland and environmental education work, at a national level and with local communities in FMUs. This need falls outside the expertise and role of COHDEFOR and would be more appropriate for AHE, a Honduran conservation work, AHE has worked effectively with RENARE, AID and other institutions in these fields and this EA. recommends it assure this role as an important mitigative measure (see section VI). In order to not further complicate project implementation, and recognizing the reduced capability that RENARE has to fulfill its official role, RENARE would be encouraged to work cooperatively with AHE in carrying out the specific actions of the FDP.

With Alternative A, COHDEFOR, AHE and ESNACIFOR would be strengthened in different aspects of environmental management as it relates to forest management. Indirectly, the MNR/MRMP and RENARE would be involved and benefit. Analysis indicates that these institutions would be willing and capable of assuming their new and augmented roles, given the resources that would be provided by Alternative A (including E.A. mitigative measures).

Alternative B would not require nor promote institutional changes nor strengthening. The GOH Forestry development strategy would be continued with limited internal resources. Divestiture of COHDEFOR owned forest industries and the implementation of the new stumpage and valuation system would continue but at a much slower pace and with very limited operational resources. Strengthening of the private sector and modernization of sawmills would not occur unless additional external funding were found.

IDENTIFICATION OF THE PREFERRED ALTERNATIVE

Alternative A is recommended as the preferred alternative. Alternative A involves the implementation of the FDP - a major USAID development assistance project to strengthen the forestry sector in Honduras, with emphasis on sustainable pine forest management. This alternative represents a seven year

effort (1988-1995) with principal components/actions in institutional reorientation (COHDEFOR) and strengthening (COHDEFOR and private forestry industry, and forest management of selected areas. The following rationale for selecting Alternative A are presented in two sections. The first presents the rationale based upon the analysis of evaluation criteria presented. The second presents additional management considerations in support of the preferred Alternative.

RATIONALE FOR THE PREFERRED ALTERNATIVE

Evaluation criteria used in assessing the alternatives were discussed and summarized previously in "Comparison of Impacts by Alternative". This section summarizes the rationale for selection of the preferred alternative.

The primary reasons for the selection of Alternative A are the positive effects it demonstrates in most of the evaluation criteria. These include distinct advantages in all aspects of environmental protection and natural resources management, as reflected in the tropical forest depletion, biological diversity, timber and physical environment/downstream impact criteria. Alternative A also has clear economic benefits both at the macroeconomic level (for the national and forest industries economies) and for local communities impacted by the project in and around FMUs. Increased employment and income generation in relatively depressed and declining Honduran rural/forested areas will have grant positive impacts where the "No Action" Alternative offers limited future options for improvement.

Alternative A represents the higher risk alternative regarding institutional and social change. To reverse the current depressed and declining situation in Honduras focusing on sustainable natural resources management in support of rural development traditional social and institutional structures have to change and this involves risks. Overall, however, these risks, as well as the numerous environmental protection concerns identified in this E.A. are attended to by a realistic and realizable set of mitigative measures and regulations that have or will be incorporated into the FDP design.

ADDITIONAL MANAGEMENT CONSIDERATIONS FOR THE PREFERRED ALTERNATIVE

Much of the concept and analysis developed for the FDP was generated from prefeasibility studies of the selected pilot FMU La Union. As is illustrated in Section V of this E.A., which discusses "Possible Conflict Between Alternatives and Objectives/Actions of other Organizations and the GOH", the dynamics of development in rural Honduras are complex and numerous actions could substantially effect the projected outputs and benefits of the FDP, both environmentally and otherwise. It is recommended that prompt and decisive attention be given to these factors to see that their impacts are to the degree possible on the positive and not on the negative side.

SUMMARY

The selection of Alternative A as the preferred alternative is a relatively obvious and clear cut decision. According to the data and information developed and gathered as part of this E.A., there will be some social, institutional and environmental risks associated with a major forestry development project. These risks are well worth taking when compared to the consequences of "no action" in light of the current trends in environmental degradation, depletion of the forest resource and rural poverty in Honduras. The combination of strengthening the national economy, gaining employment and income opportunities in chronically depressed rural areas, wide support by the general public and government officials for environmental protection, and the ability to mitigate the most serious environmental impacts while strengthening Honduran conservation institutions, makes the Forest Development Project alternative an easy decision.

IV. AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the biophysical and socio-economic components, as they currently exist, that could be affected by implementing the alternatives. Alternative A proposes implementing actions at a national level as well for specific areas (FMUs) which would be selected under the Forest Management component. An overview of forestry in Honduras and associated environmental problems is provided in Section II of this E.A. For further information, a detailed description of the biophysical and socio-economic conditions of Honduras is presented in the Country Environmental Profile (2).

For purposes of this E.A., analysis of the affected environment was done for the La Union FMU, with the assumption that environmental impact relationships would be similar for the other two FMUs to be selected in years 3 and 6 of Alternative A.

The area of influence for primary biophysical effects is the La Union Forest Management Unit, a natural watershed area formed by the Yaguala and Guata sub-basins. The area of influence for secondary biophysical effects is the Aguan River Basin which goes from the La Union FMU north to the Atlantic Coast.

The area of influence for primary socio-economic effects is the same La Union FMU. The area of influence for secondary socio-economic impacts is the Department of Olancho, and principally the northwestern part of the Department, in north central Honduras. The transportation system into La Union is being upgraded which would enlarge the socio-economic areas of influence.

DESCRIPTION OF THE LA UNION FOREST MANAGEMENT UNIT

BIOPHYSICAL CHARACTERISTICS

Size, Location and Physiography

The forest management project area is approximately 100,880 hectares in size and located in northcentral Honduras. It corresponds to the COHDEFOR Forest Management Unit of La Union, in the Department of Olancho (See Map No. 2). Within the Project area are found the municipalities of La Union, Mangulile, El Rosario and Yocon. The population of the Forest Management Unit in 1984 was 20,183 and entirely rural. The population density is 20 people/Km^2 and is dispersed among 5 municipalities, 44 villages and 335 hamlets.

Relief is broken to very steep with hill slopes ranging from 20 to over 60%. An estimated 75% of the project area has slopes over 30%. Aspects are predominantly south and southeast, but all types of exposures exist. Intermontane valleys with more favorable relief are few and small in size, occurring most notably in Padala, El Salitre, Sabanagrande, Yupito, San Pedro, La Union and Habanero-Pintora. Two of the four geologic formations that occur in the area, covering approximately 40% of the total area, are young

calcareous limestone formations with characteristic steep topography and difficult access (see Geology and Soils). Altitude of the project area varies from a low of approximately 600 m.a.s.l. near Mangulile, to 2064 m.a.s.l. on Montana de las Parras, north of La Union.

Climate

The predominant climatic conditions are those of tropical to subtropical highlands with a moisture regime ranging from moist to wet, depending on time of the year, altitude, slope/exposure and physiographic position. Precipitation is influenced by the mountains to the north and southeast of the area; rainfall comes predominantly from the Caribbean Coast to the north. Rainfall records are short and scant. The wettest months of the year are June and September with a relatively uniform rainfall pattern and moist to wet conditions most of the year. The two driest months are February and March. With approximately eleven years' record (1976-86) the Yocon station shows a mean average value of 1635 mm per year. and the Mangulile station 1350 mm. per year. Conditions become much wetter, however, above 1500 m.a.s.l. to the north of La Union, where perennial cloud forest conditions occur.

Geology and Soils

Soil information was extracted from the AHE report (1). In the project area four major soil series occur. Two are sedimentary and two are metamorphic in origin. Their locations are given in Map. No. 5, and their predominant characteristics are summarized below:

Soil Series	Origin /Parent Material	Predominant Characteristics
Jacaleapa	Metamorphic - Non micaceous schists	-Well drained, shallows soils, frequently rocky -p.H. 5.5 to 6.0 -Lithosols; in 7the Approximation are classified as Lithic Dystropepts. -Land Use Class VII -High erodability, logging & roading limitations.
Danli	Metamorphic-schists	-Well drained, deep -p.H. 6.0 to 6.6 -Inceptisols; in 7th Approximation are classified as Eutropets. -Land Use Classes IV and VII -High erodability; logging and roading limitations.
Chandala	Sedimentary-limestones and shales (lutitas)	-Well drained, medium to shallow soils, frequently rocky. - p.H. 6.5 to 8.0 -Lithosols; in 7th Approximation

		are classified as Lithic Haplustolls -Land Use Class IV to VII. -High erodability; logging and roading limitations.
Sulaco	Sedimentary-limestones	-Shallow, relatively well drained soils -Steep to precipitous topography -Rezines; in 7th Approximation are classified as Lithic Haplustolls -p.H. 6.5 to 8.0 -Land use class IV and VII

The physical and mechanical properties, and their potential productivity from an agricultural or forestry point of view, are different for each of these series. Land use practices, including logging and road construction, need to be adapted to the limitations of each. All series have high erosion potential and will require strict erosion control practices. All series have moderate to high mass erosion potential. In some series, such as the Sulaco, excessively steep topography will preclude logging and require forest protection. More detailed information for each series, including their use limitations and the geology of the area, are available in the AHE (1) and FAO (3) studies.

Minerals

No recorded mineral deposits or production are recorded within the project area, except for small, scattered gravel and stone quarries used for road construction.

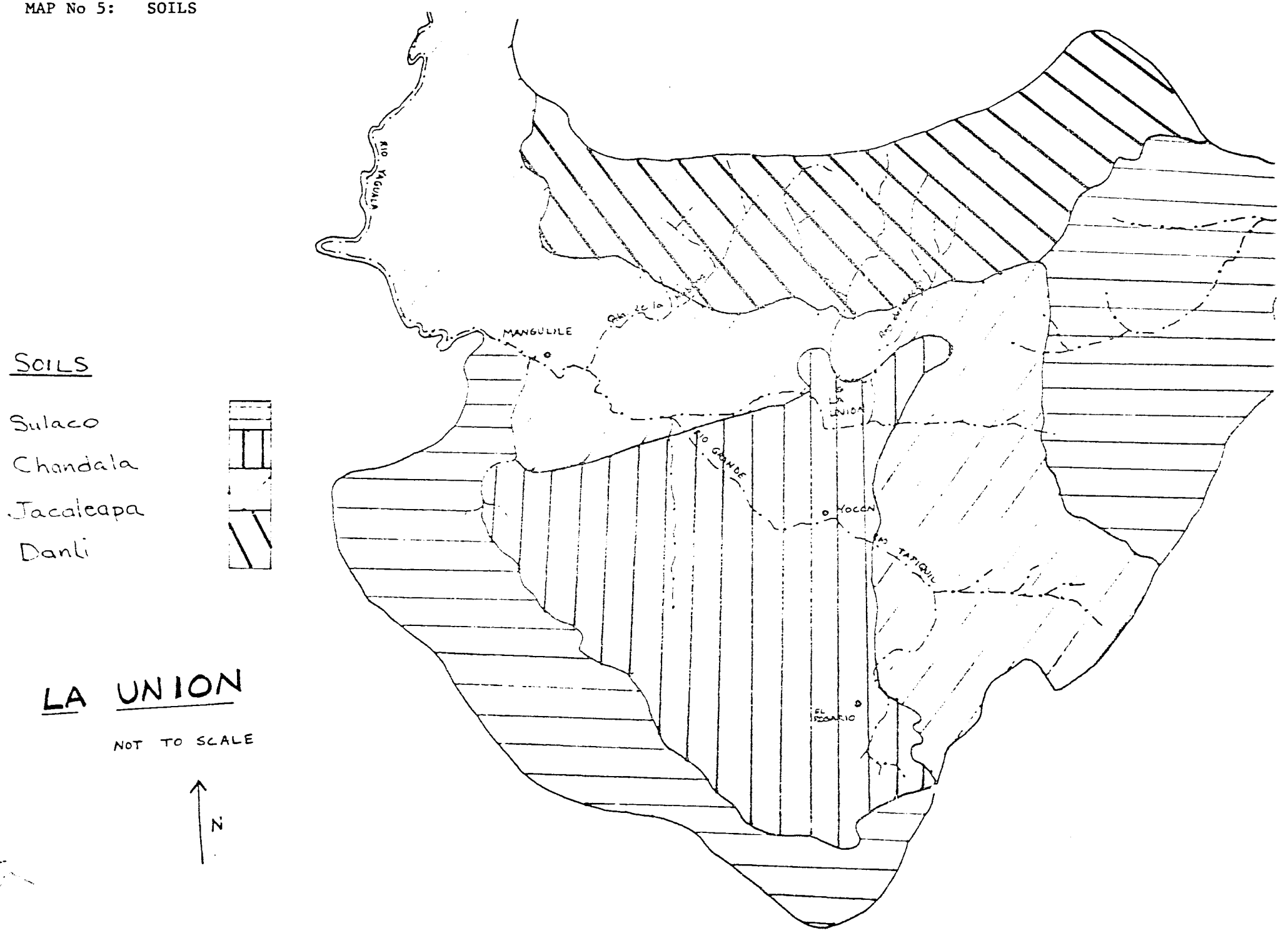
Water Resources

Watershed Interactions

The Project area is located entirely within the Upper Aguan River Basin and its sub-basins of the Yagnala and Guata Rivers. The project area constitutes approximately 50% of the Upper Aguan drainage, which is described in detail in the final report of the FAO Project Hon/77/005 (3). According to FAO, the Upper Aguan is an area of generally steep topography, fragile soils, and high erosion potential. FAO recommends caution regarding all forestry and agricultural land uses in the area to minimize flooding and siltation impacts in the Lower Aguan Valley.

The streams that drain the area are moderately to deeply entrenched into the mountainous terrain. Drainage density is moderate on the upper slopes and moderate to high in the lowlands. The streams are mostly permanent, being fed by highland broadleaf montane or cloud forests in their headwaters.

MAP No 5: SOILS



Downstream Wetlands

An important coastal wetland area occurs in the area of secondary influence in the lower Aguan valley and along the Caribbean coast to the east of the mouth of the Aguan River. Important habitats found there include coastal lagoons, swamp mangroves and palm forests. These fresh and brackish water systems are productive areas for waterfowl, fish, marine organisms (including shrimp and lobster), and in some places rare or endangered wetland species such as the West Indian Manatee. The dynamics of upland/lowland environmental interactions are active here. Upper Aguan watershed degradation especially apparent in the Department of Yoro, results in downstream flooding and siltation and has an important effect on the quality and productivity of these wetland ecosystems.

Water Quality

Water quality from the project area in terms of suspended sediment has been observed to be generally good, although no field data exists. Logging that has occurred in the area has been localized and small scale. A small logging operation in the Cerro Verde area is contributing minor amounts of sediments and causing some mass wastage, as are subsistence agricultural and grazing practices on hillslopes. The road from La Union to El Dictamo is poorly constructed and maintained, discharging sediments into the Rio Camote. In general, however, waters are clear and rivers well conserved. Where there is rural population surface waters are contaminated with human and animal wastes.

Water Uses

Water use in the area of La Union to date is underdeveloped. Surface water supplies are used for domestic consumption and farm uses, including some small-farm irrigation. The four watersheds of the area that serve as community water supplies are as follows:

Watershed(s)	Size (Km^2)	Village Served
Tapequile	25	Yocon
Camote and Carta	51	La Union and COHDEFOR Forestry Camp at Carta
La Habana and Habanita	32	Mangulile
Las Milpas	8	El Rosario

Further details for each of these watersheds are given in the AHE report (1). Their locations are indicated in Map No. 7.

The Camote River has been identified as a possible site for a mini-hydroelectric development project to serve La Union and perhaps neighboring communities.

Timber

There are 72,754 hectares of forest in the FMU (78.7%) and 21,479 hectares of land in agriculture and other uses (21.3%). Forest types as they occur are summarized in Figure 2.

Figure 2 Forest Types and Other Land Uses in the La Union Forest Management Unit

	Cover Type (Hectares)						
	Conifers		Mixed Forest		Broadleaf	Other	
	Young	Mature	Young	Mature	Forest	Uses	Total
Area	4,730	40,310	1,852	4,383	21,479	28,125	100,879
Percentage (%)	4.6	40.0	1.8	4.3	21.3	27.9	100

The broadleaf forests are not prescribed for cutting. Thus, timber resources include pine forests and mature mixed forests with 75% or more (by number of stems) of the stand in pine. Total hectareage is 49,423 hectares which over a 40 year rotation gives a total annual allowable cut of 1,236 hectares yielding 3,734,206 cubic meters total volume (For greater details see COHDEFOR Forest Management Strategy for La Union (4)).

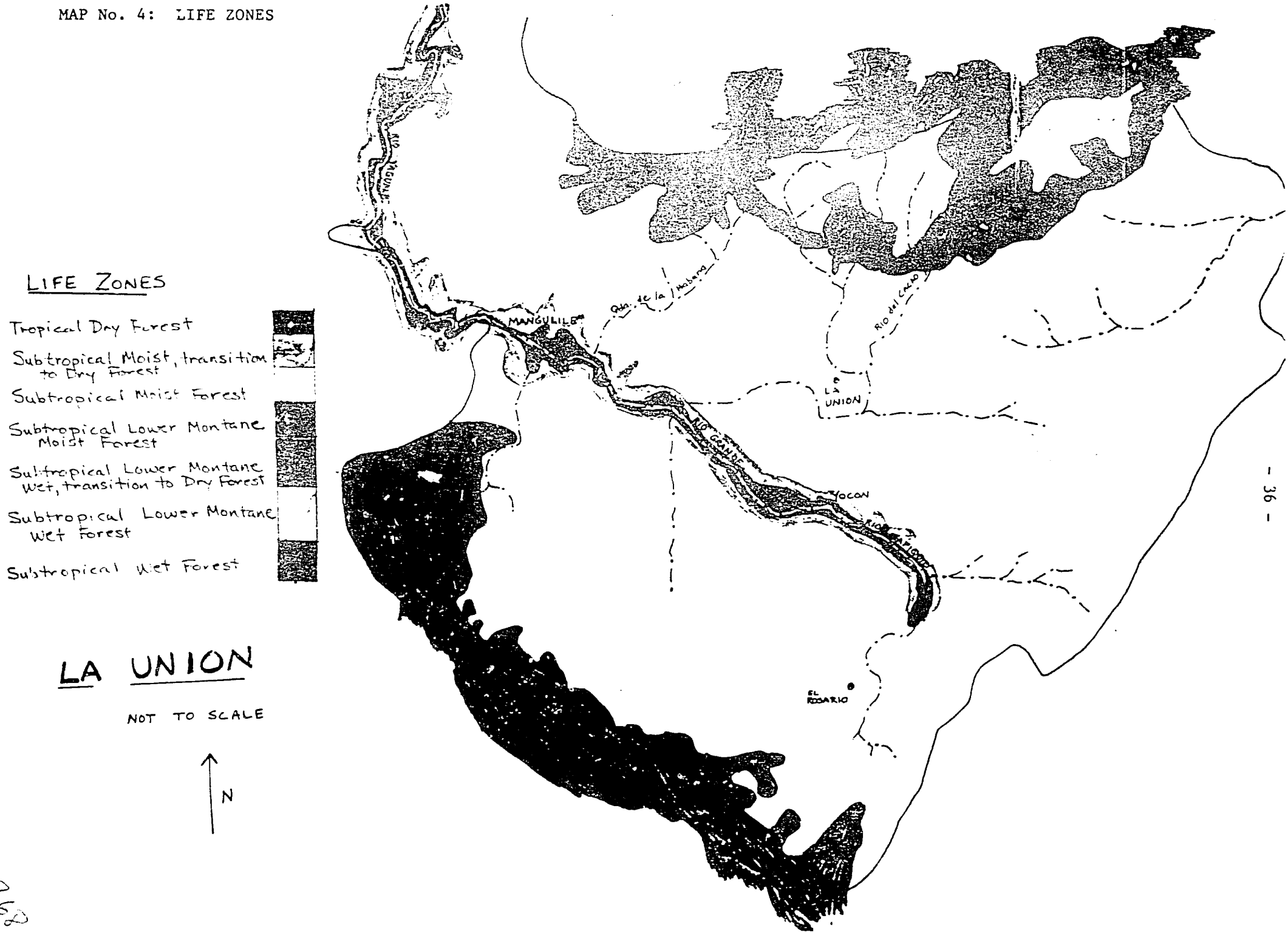
Life Zones

Based on previous Tropical Science Center mapping and a field reconnaissance work done by the Honduran Ecological Association (1), five Life Zones and two Transitional Zones occur within the project area (according to the Holdridge Life Zone System). The driest and hottest ecological zone of the area is the Tropical Dry Forest Life Zone which occurs at lowest elevations (below 700 m.a.s.l.) along the Yaguala River from Yocon to Mangulile. The wettest and coolest conditions of the area occur in the Lower Montane Wet Subtropical Life Zone which occurs along the divide northeast of La Union (see map No. 4). This is where the mountain peaks of La Muralla, Los Higuerales and Las Parras occur; here extreme physiographic and climatic conditions give rise to cloud forests and rich bio-diversity.

The major part of the La Union Management Unit is Subtropical Moist Forest, covered with native pine forests predominated by Pinus oocarpa in mature or over-mature stands. These forests represent a valuable resource for wood, paper and pulp production, especially those developed over the Danli soil series where tree growth and development is impressive. Stands of Pinus maximinoi and liquidambar are likewise of potential economic and genetic importance for the production of seed and resin, respectively.

All of the Life Zones occurring in the project area are described and characterized in a general way in the AHE report (1). An idea of the predominant species of plants and animals is given for each Life Zone in Appendix A. Extent and characteristics of the forest cover are discussed in depth in Section 4 of the COHDEFOR Strategy Document (4). To date large scale commercial forestry has not been carried out in the La Union District with the exception of a concession given to Luis Velasquez near Cerro Verde. The

MAP No. 4: LIFE ZONES



268

majority of the pine forest in the project area is virgin timber. The trees are mature to overmature.

On some sites pine is found mixed with oak species (Quercus spp.), which compete better on soils cleared by fire and grazing. On such sites the oak gradually take over previously established pine stands. On other sites certain edaphic and light conditions permit the establishment of nearly pure oak stands which are valued by local communities as a source of fuelwood.

Natural Vegetation and Wildlands

No wildland areas have been decreed in the past within the La Union FMU. Decree No. 120 dated November 7, 1966 established all of Olancho including the La Union Unit as a national forest reserve. However, this reserve status has, in reality, never been enforced.

Plants

There are no endangered or threatened plants known to occur in the FMU. However, a field survey is needed to identify any endangered or threatened plants or suitable habitat in the project area (see mitigative measures, Section VI).

Species distribution varies according to elevation, rainfall, orography and temperature. Two uncommon, possibly endemic, pines species (p. maximinoi and p. tecumani) are found on mountain tops in predominantly broadleaf forest.

Annex I provides a list of predominant plant species that occur in the different altitudinal belts/ life zones of the area.

Wildlife and Sensitive Species

Biological diversity is generally low in the Subtropical Moist Forest where Pinus oocarpa predominates, and wildlife is generally scarce (Map No. 5). Common bird species include the black vulture, woodpeckers, roadrunners and some songbirds; common mammals include the grey fox, coyote, squirrels, white tailed deer and raccoon.

In the highland areas above 1,500 m.a.s.l., best represented and dominated by the Lower Montane Life Zones, bio-diversity increases dramatically. Here the climate is cooler and wetter and pine is replaced by broadleaf forests. Wildlife species are much more abundant. Endemism is common, especially in species of amphibians and reptiles. The numerous birds that occur include the endangered quetzal and the rare "mirlo de montana" (mountain robin). Rare mammals include the tapir, peccary, mountain lion, white-tailed deer and the endangered ocelot and jaguar. These Lower Montane Life Zones are valuable not only for their genetic richness but also for their important hydrologic roles since they form the headwaters of all the major watersheds of the area. The remoteness and the lack of vehicular access to these areas protects them from logging and excessive hunting.

A detailed inventory of wildlife and vegetation has not been done for the project area, although this will be carried out as part of the resource planning done for the FMUs under Alternative A. The commentary of this E.A. is based upon review of available information and field reconnaissance carried out by the AHE team in November-December, 1986. Further information is presented in the AHE report (1).

Importance of Wildlife

The area provides a fairly diverse variety of habitats between pine, broadleaf and mixed forests. Although there are no studies or long term-research that describe species/habitat interactions, several knowledgeable Honduran biologists familiar with and that have done field work in the La Union area have indicated that a range of species such as deer, peccary, tapir, mountain lion and numerous birds, including migrants from northern latitudes, undoubtedly use different parts of the area as seasonal habitat. Vertical migration between the highland broadleaf forests and the pine and mixed forests probably occurs for feeding and other types of behaviour. Year-long habitat is provided for residents with small home ranges and endemics. As was mentioned earlier, the greatest diversity and concentration of wildlife species occurs in the highland broadleaf forests. (See the ecologist's report (1).

Campesino families hunt for and utilize wildlife species as an important protein source. When possible birds, cats and other valuable species are also caught and sold for income.

On-site features of greatest concern are those which are vitally necessary for one or more species and vulnerable to human activities. Snags which provide nest sites for cavity dwellers (such as the quetzal), solitude and range for secretive and far-ranging species (such as the large cats), feeding areas, deer fawning areas and spawning beds for fish species are examples.

The future condition of habitat and streamside environments which provide cover, food and water to many species, are of greatest concern.

Fisheries

Little is known about the fisheries of the project area. No major game nor commercial species are known to occur. Native species occur in the larger rivers and are harvested in rudimentary ways by the local population. Native fish species will probably be favored to the degree that siltation and the other hydrologic impacts of logging and roading are mitigated, and streamside environments are protected.

Air Quality

Information and data on air quality is not available. Field observations indicate that air quality is generally high but highly influenced by climate, season and fires. The dry season brings with it the risk of forest fires, which are fairly common. Particulate matter and other wood smoke emissions are produced. The months of greatest risk are February and March. No problems from vehicular, industrial or residential pollutants are known.

310

Range

In the La Union FMU a 1983 survey determined that 20,303 head of cattle existed giving an average stocking density of 1 head for each 5 hectares. Cattle are generally free ranging or enclosed temporarily under the pine forests. Ticks and chiggers are controlled and range maintained by periodic burning which frequently kills pine regeneration and leads to wildfires and forest depletion. Little or no control is currently exercised over grazing practices. If properly regulated and controlled, it could be a compatible use of the area in association with forestry.

SOCIO-ECONOMIC CHARACTERISTICS

General information on demography, socio-cultural aspects of the population, production systems, health and public services, employment, and institutional activities is presented in the AHE report (1) and the project paper (6). Salient characteristics are summarized here.

Population

The population estimate for 1984 for the five municipal jurisdictions of the area gave 20,183 inhabitants. Population distribution is as follows:

Municipality	Population
La Union	3,280 with 5 villages and 69 hamlets
Yocon	6,490 with 10 villages and 94 hamlets
Mangulile	5,433 with 16 villages and 100 hamlets
El Rosario	2,678 with 8 villages and 30 hamlets
Jano	2,302 with 5 villages and 42 hamlets

Population density in the project area is 20 inhabitants/Km^2 while the density for the entire Department of Olancho is 9.7 inhab./Km^2. Sixty one percent of the population of the area is in the 4 to 19 years old age group. The total male working force is approximately 6,000 and female is 4,000 individuals. The population is characteristically rural and currently relatively isolated from large urban centers (i.e., four hours to Tegucigalpa by car).

Education

Primary education is offered to the majority (96%) of all the school age children in the area who total 3,731. No pre-primary nor adult education is offered. Limited secondary school education is available, with one school in La Union (78 students and 5 teachers) and another in Yocon (54 students and 6 teachers).

Public Services

Health

In the 5 municipalities of the area 5 health centers exist with 5 auxiliary nurses and 37 trained midwives. In 1985 service was given to 15,380 cases (75% of a total population of 20,183) averaging 1,281 monthly cases. One regional doctor working out of Juticalpa, Olancho, provides periodic attention in La Union.

Thru 1986, the most common causes of sickness were the following: gastrointestinal infections and diarrhea; respiratory disorders; malnutrition; intestinal parasites; malaria; skin and food diseases; rumatic heart disease; wounds; mental disorder and violence; flu; measles; tobacco addiction; alcoholism; dental problems; gyneacological disorders; and infections.

Other Public Services

Housing is principally the traditional rural construction out of bahareque (sticks and mud) and adobe. No GOH housing programs occur.

Rural aquaducts exist only for municipalities and provide untreated surface waters. Although no studies have been made, all sources are known to be contaminated, Mangulile being the worst case where coffee farms in the headwaters pollute the system with coffee wastes and probably agrochemicals.

Postal service is available twice weekly only in municipalities. Telegraph exists in La Union, Yocon, Mangulile and El Rosario. No public electricity is available. A few private diesel generators do exist.

Roads and Transportation

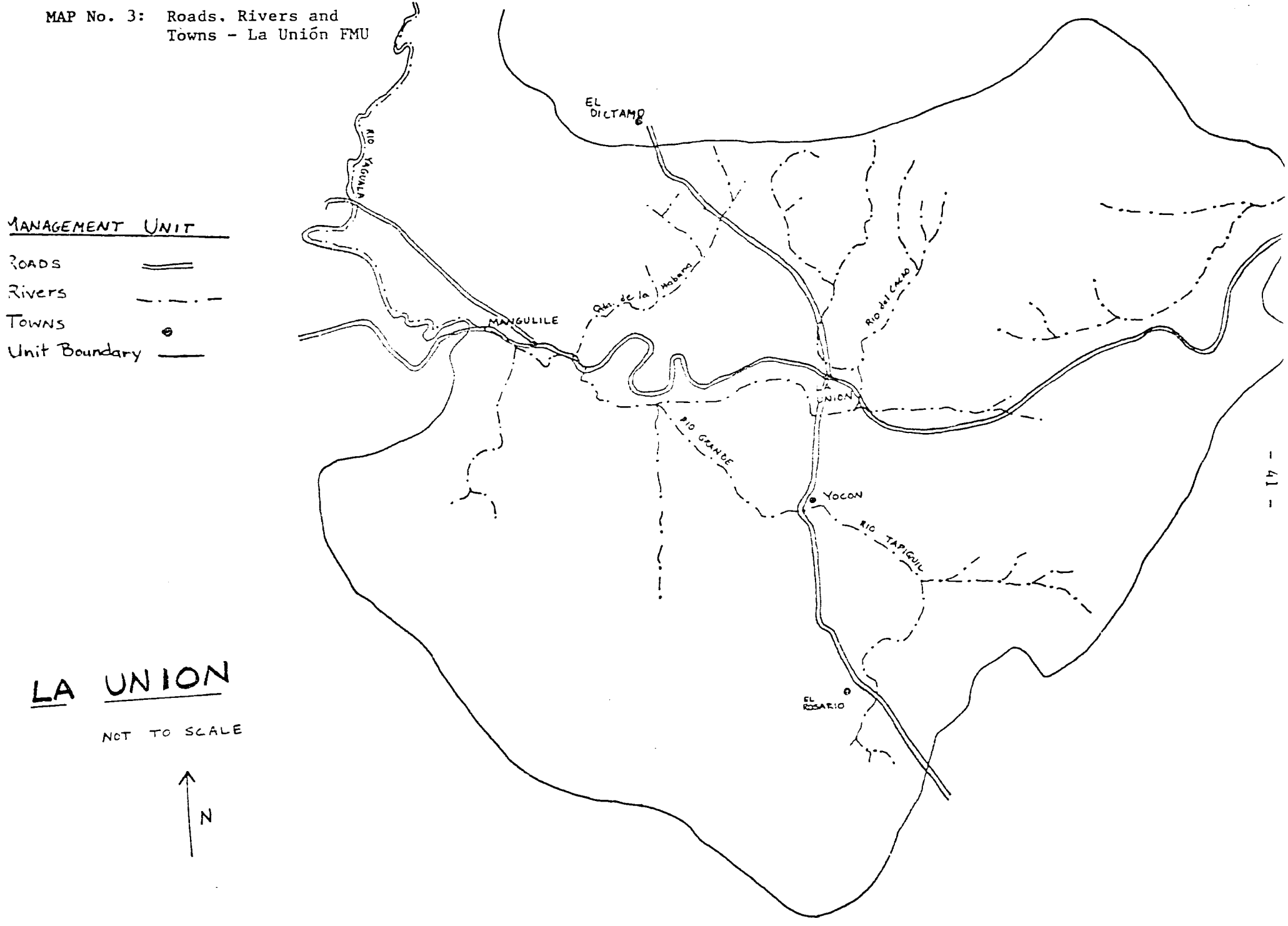
The project area currently has a good and fairly extensive road network constructed by the GOH and COHDEFOR in previous years. USAID contributed funds to construct forest camps at Jutiapa, approximately 65 Kms. to the south of La Union, and Carta, 6 Kms. to the east of La Union. The network of gravel roads that has been built, principally for forest protection, totals 150 Kms.

Recently COHDEFOR funded the construction of a new primary regional (graval surfaced) road from Salama to La Union (36.5 kms). The 19.5 million lempira cost of the road, financed through an IDB loan, is to be repaid with stumpage fees from the CORFINO project.

Currently under construction are two regional roads that will interconnect La Union with Yoro and the north coast. One is a logging/haul road being built by YODECO that will connect Mangulile to Yoro. The other is a GOH funded highway connecting La Union to El Carrizal, forming part of the 40 km. regional primary highway to Mame and the lower Aguan and port cities of La Ceiba and Castilla. For further details see COHDEFOR (4) and Map No. 3.

There is a small dirt airstrip currently in disuse at the COHDEFOR Carta forestry camp.

MAP No. 3: Roads, Rivers and Towns - La Unión FMU



OTHER RESOURCES/USES

Land Tenure

In 1966, by means of Decree No. 120, the Olancho National Forest Reserve, including the La Union FMU, was established as a protected zone and national reserve of pine and broadleaf forests. This Decree has affected the current land tenure of the project area, which can be summarized as follows:

Figure 3. Area and Type of Land Tenure, based on 1968 Cadastral Survey

Type of Tenure	MUNICIPALITIES - Surface area (Has.)						
	La Union	Yocon	Magulile	El Rosario	Jano	Total	%
Private	12,931	11,028	8,867	7,561	4,704	45,091	28
Municipal	-	2,773	2,258	-	3,410	8,441	5
National	37,442	8,482	31,059	8,648	23,257	108,888	67
TOTAL	50,373	22,283	42,184	16,209	31,371	162,420	100

As can be observed, 67% of the areas is national forest, 28% is private and only 5% municipal/communal lands.

Land Use

Neither detailed cartographic information nor recent air photographs exist for the La Union Management Unit to give a detailed picture of land use. Based on the INFONAC inventory, an overflight and field work, however, it is estimated that 27.5% of the area, approximately 28,000 hectares, are currently under traditional agricultural uses; of this an estimated 8% of the FMU, approximately 800 hectares, is under coffee production. The remainder of the project area, nearly 73,000 hectares is covered by natural forest.

Agriculture

Most agricultural land uses are located in and around Rosario, Yocon, to the south of La Union and southeast of Mangulile. Predominant crops are corn, beans, and small plots of rice, sugarcane and plantains, cultivated in a untechnified, subsistence manner.

Environmental problems associated with the traditional coffee, grazing and burning practices occurring in the project area are discussed in detail in the AHE report (1) Section 1.3.10, pages 40-51.

Agricultural Extension and Credit

Agricultural credit and technical assistance is offered for basic crops (corn and beans) and coffee production (via the AID-IHCAFE Project). Also, a World

Bank credit line is available for small cattle operations. All credit is administered through the National Bank for Agricultural Development (BANADESA). The Ministry of Natural Resources, through its Department of Recursos Naturales Renovables (RENARE) offers assistance in basic grains through the Guayape project which covers El Rosario, La Union and Yocon.

Tourism and Recreation

There are currently no known organized or commercial tourism or recreational uses of the area. Local inhabitants generally have free access to the national and municipal lands for recreation.

Archaeological, Cultural and Historic Resources

This E.A. has not located any archaeological, cultural or historic sites within the project area. Preliminary assessment identified the Xicaque Indian tribe and the buried city of San Jorge de Olancho as possible concerns. Subsequently both were discarded because they are not in or near the project area of and its area of direct influence.

Visual Resources

The La Union area presents the traveler/visitor a varied rural landscape with a predominance of mountainous forested uplands. Lowland parts of the area offer a rural agricultural setting with transition to timber covered slopes and surrounding mountains to the north and southwest. Generally, the scenery is high in scenic qualities and variety.

The aesthetic values of local inhabitants have not been measured.

V. ENVIRONMENTAL CONSEQUENCES

This chapter is the scientific and analytic basis for the comparisons of alternatives contained in Chapter III. Chapter IV AFFECTED ENVIRONMENT describes the situations and conditions that exist within the La Union Study Area, and provides the basis to understand the possible future environmental consequences of implementing either of the alternatives. Environmental consequences can be either beneficial or adverse, direct or indirect. Consequences also vary in importance from negligible to those which are significant.

The environmental consequences described in this chapter are grouped under the same general elements and in the same order used in chapter IV, AFFECTED ENVIRONMENT. For each element, biophysical resources for example, consequences are presented for each pertinent action for that Alternative. As applicable, each section includes discussion of direct and indirect effects. Certain elements, such as topography, climate, geology and minerals would be effected negligibly, it at all, by implementation of any alternative and, therefore, are not discussed. Consequences are presented for the actions proposed in Alternative A and for the "No Action" Alternative.

ALTERNATIVE A

BIOPHYSICAL RESOURCES

SOIL AND WATER

Alternative A. Institutional Reorientation of COHDEFOR

The proposed reorientation of COHDEFOR would put more of the institution's resources and considerable technical capability in regulation and control to see that resources are conserved and properly managed. Using the La Union Management Unit as a testing ground, environmental guidelines and regulations would be developed to mitigate impacts of forest harvest and management practices. Eventually these controls would be developed and expanded to cover the whole country. Training would be given to COHDEFOR staff on modern methods of environmental assessment and impact mitigation relating to forest management.

Forest Management Plan

The FMP for La Union would establish a series of environmental protection measures for the area and would provide a mechanism for control during project implementation. An initial environmental review and periodic evaluations would assure compliance. Applied research, studies, and water quality/discharge monitoring associated with forest harvest areas would provide means of evaluation and improvement of management practices.

Forest Protection

Several forest protection actions would be carried out as a part of forest management. This would include: protecting land too steep for logging, (50% slopes); protecting riparian vegetation around springs, streams and other water bodies (see section Forest Harvests); the establishment of two major hydrologic/biologic reserves (see section on wildlands) which would protect

the headwaters of most of the major watersheds in the FMU; and watershed planning and management for community water supplies. Fire protection measures would preserve the quantity and quality of vegetative cover in pine forest areas. If implemented correctly and in a timely fashion these measures should play a major role in protecting soil and water resources.

Forest Roads and Trails

Forest roads and activities associated with penetration roads are probably the actions of greatest potential short and long-term environmental impact of the project. Soil and water impacts can result directly from road construction and maintenance activities or indirectly from the effect of colonization and increased access. Environmental regulations and guidelines will be developed and applied as a routine part of forest management under the project.

The mitigative measures proposed are summarized in Chapter VI. Roading could lead to accelerated erosion and a deterioriation of a generally good water quality (interns of sediment discharge) in La Union area. But proper implementation of the environmental regulations and guidelines should keep water quality and erosion impacts at satisfactory levels and not cause significant long-term damage to the resource.

Silviculture

Improved regeneration of pine forests would lead to denser, healthier stands generally more protective of soil and water resources. Scarification and other practices to improve regeration, if properly exercised, should not adversely affect soil erosion or water quality.

Forest Harvest Practices

Logging practices will be improved substantially over the traditional systems. Environmental regulations and norms will be implemented. Logging will cause some soil erosion and would have a temporary negative impact on water quality compared to current conditions with no logging. However, proper implementation of measures to mitigate the impact of logging in association with the other forest protection and management practices, should keep erosion and loss of water quality at acceptable levels without damaging the resource. The strict supervision and enforcement of logging and roading contracts, plus environmental evaluations and monitoring of water quality and discharge from logging areas, will provide needed control.

Small Farmer Income Generation

No adverse impact.

Improved Agricultural and Grazing Practices

The very nature of these activities, agroforestry and soil and water conservation practices, implies that they will have a positive effect on soil and water resources.

Strengthening the Forest Industry

Credit and technical assistance would be directed at more efficient timber utilization and sawmill operation. Technical assistance and environmental regulations/guidelines would eventually be applied at a national level, improving forest harvest practices. Credit would not be given for logging equipment and therefore will have no direct effect on soil and water resources.

IMPACT ON TIMBER PINE RESOURCES

The challenge in terms of the forest resource lies in carrying out appropriate forest management to assure that a healthy forest cover be maintained.

Institutional Reorientation of COHDEFOR

Starting at the La Union management unit, the reorientation of COHDEFOR would change the current methods of selling timber. The new standards should increase the amount of timber removed from the forest without increasing the actual numbers of trees cut. Eventually, these standards would be developed and adapted for the entire country, hopefully in time to reverse the nationwide trend of deforestation.

Forest Management

Forest Management Plan - La Union

The long-term management plan for La Union would establish sustained yields from the natural resource. It would allow for long-term stability and direction in forest management, which would be less susceptible to changes in government and organizations than without a plan. It would require certain checkpoints, such as establishment of regeneration, which can be easily overlooked if a plan does not exist. A management plan would create awareness of the possibilities and opportunities for determining forest conditions in the future by proper management planning.

Forest Protection

Insect and Disease

Outbreaks of *Dendroctenus sp.* bark beetle would be detected sooner because of improved monitoring. Sawtimber stands would be better protected by early detection and immediate sanitation cuts. *Pinus oocarpa* seedlings are susceptible to attack by a fusiform rust. This is not a problem in Honduras at the present time.

Fire Protection

Seedling survival would increase because of reduced forest fires in young pine stands. Fire towers and better road systems would make early detection

possible, reducing the size of fires. Elimination of frequent forest fires could allow slash and debris to build up, creating the risk of a catastrophic forest fire. The quality of grazing in forest areas may be reduced without periodic burning.

Road Network

New roads tend to open an area up to colonization by campesinos. Increased forest fires (arson) and timber theft could occur as new roads are built. Closing roads, and patroling those roads that remain open would help reduce pressure from local people on the forest resources. Improved roads would provide better access for fighting forest fires and treating beetle infestations.

Silviculture

Improved management for sustained yield would result in better age class distribution. The best trees in each stand would be left as seed trees. This should improve the overall genetic quality of the seedling stand.

Regeneration would be closely monitored and if inadequate number of seedlings survive, remedial actions would be taken to ensure regeneration. In mixed stands which are predominantly pine (75% or more) the broad leaf component would be eliminated except along streams and at water sources. This would eliminate some of the diversity that now exists, and could make the pine stands more susceptible to infestations of disease or insects.

Small Farmer Activities

By improving the economic situation of campesinos, the need to illegally and destructively exploit resources should decrease. Pressures for firewood from the forest should decrease as agroforestry projects become fully productive. With increased community education projects, the campesino's view of the forest as something to be conquered should change to an awareness of the forest as a resource to be conserved. Rather than a destructive force, campesinos could become if not productive at least innocuous.

Improved Agricultural and Grazing Practices

Grazing restrictions in seedling stands would increase survival tremendously. Later, when trees are large enough to be unpalatable, grazing could be a useful tool for reducing competion and risk of wild - fire. Stable agricultural practices would reduce or eliminate the trends of shifting agriculture following directly behind timber harvests. Instead, regeneration would be able to become established immediately following a cut. There is conceivably a risk of introducing exotic weeds or pests through the agroforestry program, however, this is not planned. The decision to introduce exotics would need to be addressed in a separate document.

Strengthening Forest Industry

Better standards of utilization should require fewer trees to produce the same amount of volume. COHDEFOR will have the option of reducing the area cut per year. Less slash would be left behind so the ground would be cleaner following a harvest cut. Site preparation could be less intensive (and therefore less expensive) and seedling survival would probably increase. Fire hazard would be reduced if less slash were left. Removing more biomass from an area, means leaving less organic material to decompose into the soil. However material from needles and branches would be available for decomposition, and these would be sufficient.

NATURAL VEGETATION AND WILDLANDS

The FDP promotes several direct actions which would create and protect two wildlands and other natural areas in La Union. The establishment of forest unit planning and improved management practices in general would contribute to the protection and management of natural stands in the areas of influence of FMUs througnout the country in many ways.

Institutional Reorientation of COHDEFOR

The action of bringing forests under regulation and enacting environmental planning with forest management will promote the protection of natural vegetation (especially broadleaf forests) and wildlands for many FMUs.

Forest Management

Forest Management Plans

As part of the planning exercise for selected areas, protection forests and reserves would be identified, and management guidelines established for them.

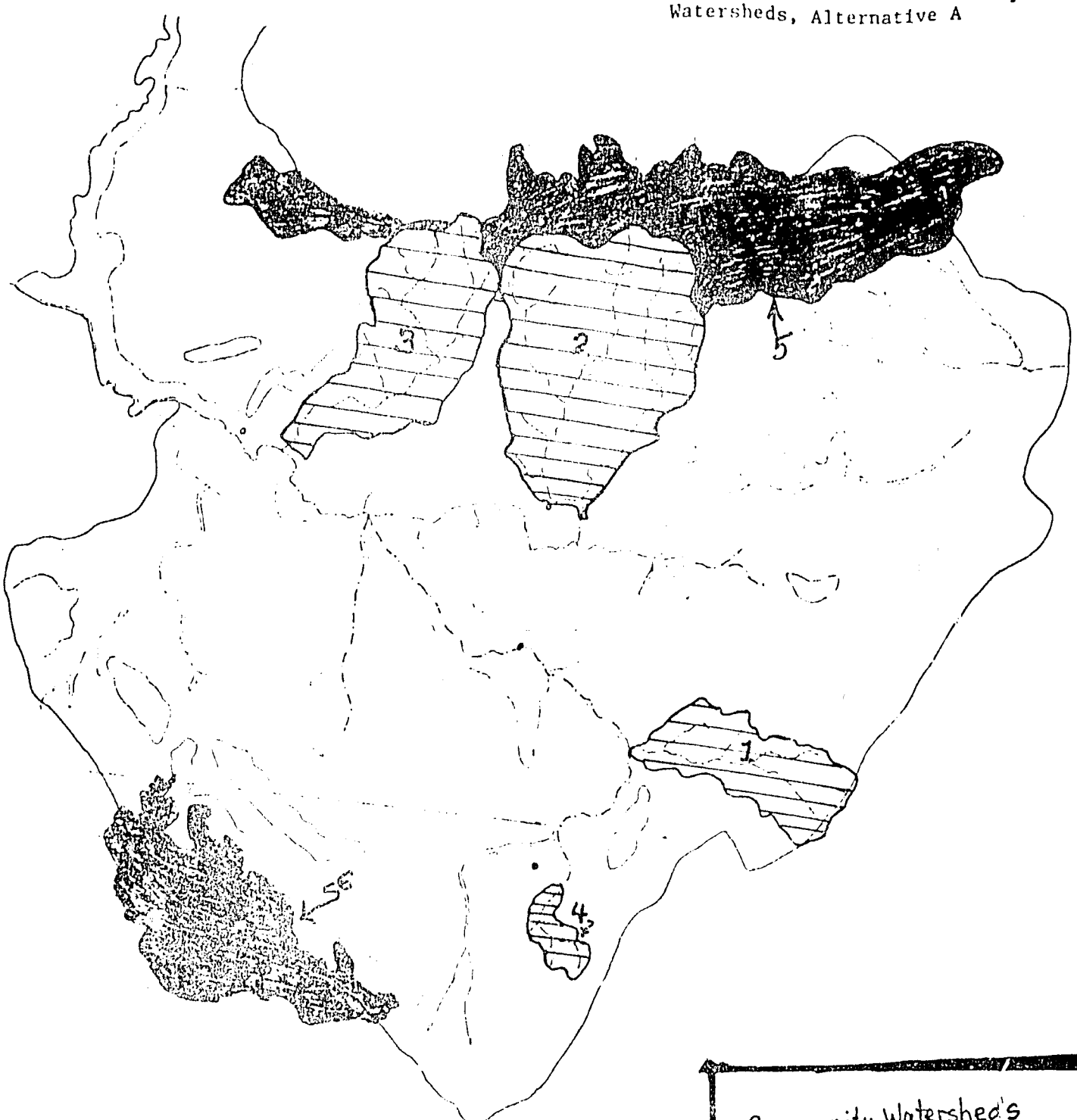
Forest Protection - La Union

Two wildland areas covering approximately 115 km2 of the FMU would be established and protected. In addition, riparian vegetation in commercial pine forests and excessively steep areas would be excluded from logging. Community watershed management actions would also have positive effects and would lead to the protection of a larger area of protected watersheds. Other forest protection measures relating to fire and pest control would have positive incidental effects on the adjacent natural areas.

Forest Roads and Trails - La Union

The placement, construction, and maintenance of roads and trails will take into account natural areas and wildlands, and contribute to their management objectives. Logging roads will not be constructed within or close to the two wildland areas, and special measures would be taken to control road use and access to sensitive sites. The mitigating measures relating to roads and trails should give adequate regulatory power to the organizations responsible for protecting and managing natural areas and wildlands.

MAP No. 7: Protection Areas and Community Watersheds, Alternative A



LA UNION

NOT TO SCALE

N

Wildlands

5 - Montaña La Muralla, Los Higuerales y Las Parras

6 - Montaña El Armado, Rompeculo y El Boqueron

Community Watershed's

CATCHMENT No.	COMMUNITY
1 - Tapequile	Yocon
2 - Camote and Carta	La Union
3 - La Habana/Habanita	Mangulile
4 - Las Milpas	El Rosario

Silviculture

Silvicultural practices will be carried out in commercial pine forests adjacent to, but not overlapping natural areas and wildlands. Some silvicultural practices such as prescribed burning and natural regeneration of pines could have minor impacts, but these will not normally be significant.

Forest Harvest Practices - La Union

Forest harvest will be programmed for the commercial pine forest lands of the FMU over a 40-year rotation. These forests will be regenerated and managed on a sustainable basis. Adjacent natural areas including both protection forests and production reserves (too steep for logging) would not be directly affected, with a few minor exceptions. Sustained yield should make it unnecessary for loggers to encroach upon the reserved areas. Forest roads would occasionally have to cross, with bridges, rivers and streams as well as traverse riparian zones. No streambottom fords or their equivalent will be allowed and measures will be taken to minimize road impacts through riparian protection areas. The production pine reserves with slopes too steep to permit traditional logging could conceivably be opened up for management in the future if more sophisticated equipment (causing less soil disturbance) could be implemented. These exceptions would be controlled by environmental regulations and procedures established in the forest management plan and timber sale contracts. Forest management would actually protect the natural areas which, following the current trend, would otherwise be destroyed.

Small Farmer Income Generation

No adverse impact is foreseen.

Improved Agricultural and Grazing Practices

No adverse impact is foreseen.

Strengthening the Forest Industry

Better standards of forest management to be promoted as part of this activity should have an indirect beneficial effect on wildlands and natural areas at a national level. Environmental regulations and technical guidelines should provide the opportunity to protect additional natural areas associated with FMUs.

IMPACTS ON WILDLIFE AND FISHERIES

Although there are no direct actions concerning wildlife and fish, all of the proposed actions will affect the quality and quantity of habitat available to wildlife and fish.

Institutional Reorientation of COHDEFOR

The action of bringing forests under regulations will incidentally improve wildlife habitat.

Forest Management - La Union

Forest Management Plan

As a condition for implementation of the plan, certain mitigating actions will need to be stated to protect wildlife and habitat. These actions could include stand size, placement of cuts in non-contiguous blocks, leaving snags and den trees, and protecting streamsides and other critical habitat. There should be no adverse effects.

Forest Protection

Disease and Insect Protection

Small sanitation cuts would create temporary openings that would be utilized by wildlife. There would be no adverse effects.

Fire Protection

Decreased wildfires would reduce hazards to groundnesting birds and animals. However frequent burning undoubtedly creates new palatable sprouts. Reducing fires would decrease the number of sprouts available.

Road Networks

Roads into the production areas will allow better access for poachers. Closing roads to vehicles may protect large animals, but small birds and mammals would still be easily carried by hunters on foot. Roads which are closed and seeded with grass provide temporary habitat for insects which are an important food source for birds. Most endangered species of animals occur in the broadleaf forests that would be set aside as reserves. Roads would be built away from these reserves in order to reduce human contact with wildlife. By putting road systems under a management plan, potential to affect wildlife and habitat downstream would be greatly reduced.

Silviculture

Currently, the pine forest provide habitat for very few wildlife species. For the most part, wildlife habitat in the pine areas should be improved as age classes become more evenly balanced. Some wildlife may return to pine forests when greater age class diversity is established. In mixed stands of approximately 75% pine (by number of stems), the broadleaf component would be eliminated except near water. In areas where oaks are removed, there would be a reduction in available hard mast. However the decrease in oak mast would be offset by an increase in habitat created by pine management. Stands with greater than 25% broadleaf will be managed as broadleaf forest.

Sedimentation in streams would adversely affect fish. Therefore buffer strips would be maintained 100 meters from streams and 200 meters from springs. This should more then adequately protect the fish. Downstream wildlife and fish would also benefit from buffer strips and reduced sedimentation.

283

There are gaps in knowledge concerning what wildlife exists in La Union Management Unit and what the habitat requirements would be. It would be unwise to risk isolation or a significant reduction in size of any of the life zones. Only four life zones are included in the protection forest, from subtropical wet forest up to lower montane subtropical moist forest. Two life zones, tropical dry forest and transition from dry to subtropical moist forest, are already in a degraded state due to pressure from human populations. No change in management is planned for these. The last life zone, subtropical moist forest, is where most of the forest management will occur. Although none of this last zone will be included as protection forest, inoperable steep slopes will effectively create reserved areas of overmature pine. Placement of regeneration cuts in noncontiguous blocks would help create continuous habitat from the pine forest to the protection forest. This should be sufficient habitat protection until more information has been gathered concerning wildlife in the management unit.

Small Farmer Activities

Raising the standard of living of the campesinos should reduce hunting pressure on wildlife. Presumably campesinos would prefer to eat meat such as rabbits, goats, chickens and pigs rather than traditionally non-game animals such as songbirds. There would be no adverse effects.

Improved Agriculture and Grazing Practices

Regulated grazing may help reduce incidence of wildlife/livestock competition. It would also reduce the chance of livestock falling prey to larger preditors. Improved agriculture should reduce or eliminate the need for shifting agriculture, making protection of critical habitat much easier. And small animal projects may reduce hunting pressure on wildlife.

Strengthening the Forest Industry

Increased utilization would mean that smaller areas could be harvested to produce the same volume of lumber. This would improve wildlife habitat by creating small temporary openings while leaving most of the forest as growing stock at any one time. Reducing the amount of slash left on the ground after a cut would reduce habitat for small mammals which use slash piles for nests.

AIR QUALITY

The proposed alternative would not greatly affect air quality. There would be some seasonal improvement in air quality if the number of wildfires were decreased. These would be partially offset by smoke from prescribed burning. Fumes from the operation of heavy equipment would not contribute significantly to air pollution.

284

BIOLOGICAL DIVERSITY

The species diversity in pine management areas should have an overall increase. Some oaks and other broadleaf trees may drop out of the mixed forest edges, however, wildlife species should increase. In recently cut stands, young sprouts will improve habitat for deer and other herbivores. Insects, snakes, birds and small mammals should also move into these stands. As the number of different age classes increases, the number of species moving into the management area and establishing viable populations should increase. Habitat diversity and edges should increase with management over the rotation. In the protection forests, the number of species should remain fairly constant. In the lower broadleaf forest where no protection is planned, biological diversity would probably decline as human population pressures increase. The total effect of this alternative would be to increase the diversity of habitats. Representative pieces of critical habitats would be preserved. Cloud forest, many ages of pine forest, riparian habitats and agricultural areas would all contribute to the diversity of the unit. Critical habitats which occur downstream would not be degraded because of management practices in La Union.

B. NO ACTION

The biggest risk of choosing this alternative is the danger of missing opportunities to improve the lives of th campesinos while assuring better forest conservation. Following current trends, the timber resource would be depleted in 10-15 years.

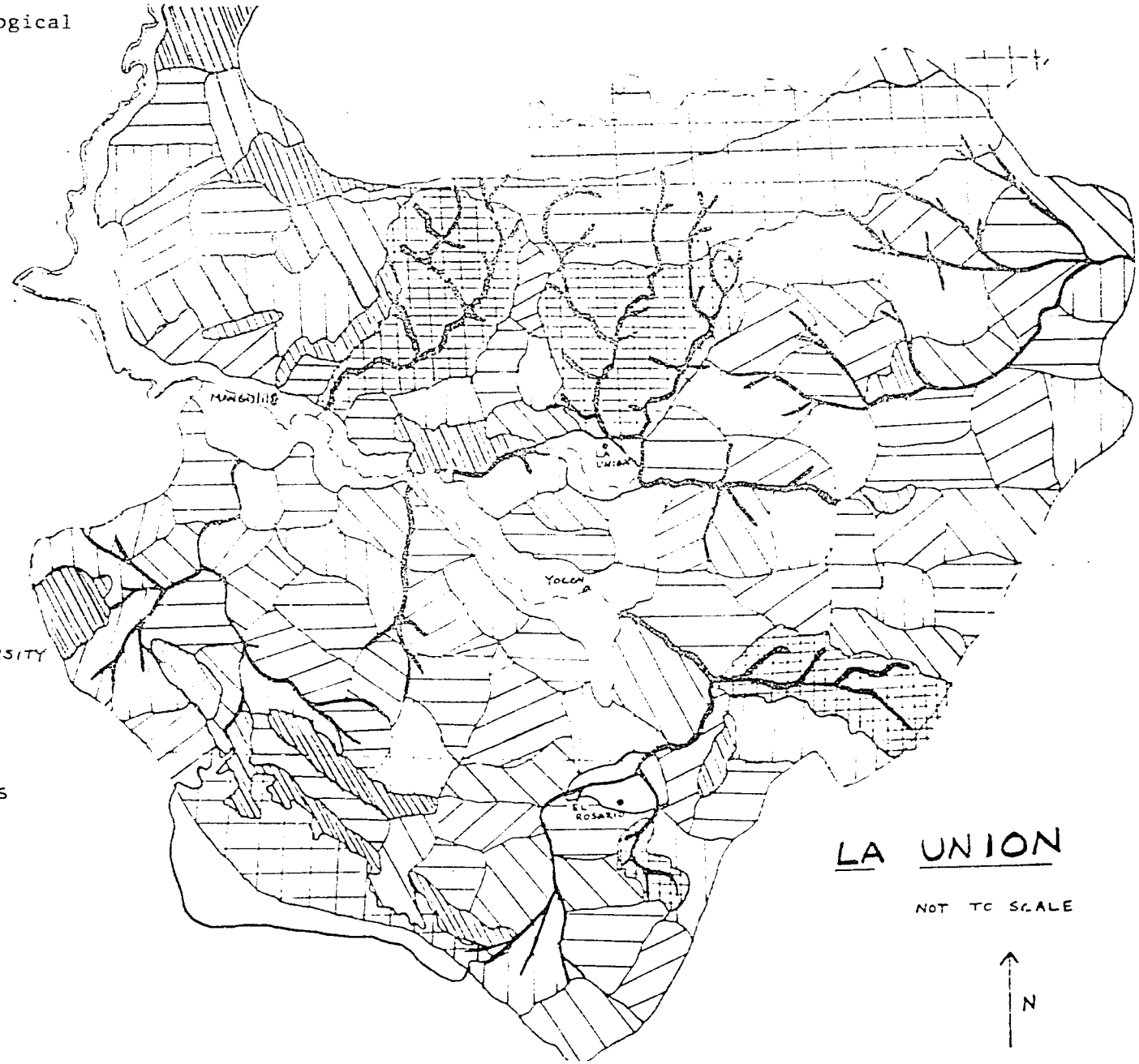
SOIL AND WATER

Currently there is no protection of water sources or the land next to water. Quality of water would continue to deteriorate locally as well as downstream. Important watersheds for the principal towns of La Union, El Rosario, Mangulile and Yocon, would not be protected. If these watersheds were deforested in the future, it could adversely affect the quality and timing of water flow. Fewer roads would probably be built, reducing the chance of erosion. However, new roads would probably be built by people who do not have engineering training. Erosion potential of each road would therefore be increased.

TIMBER

The timber resource would continue to be used in the current fashion. Approximately 50% of the merchantible wood would be wasted. The best trees would be harvested leaving poorly formed pines as seed trees. Regeneration would not be monitored, and forest fires would not be reduced. Natural regeneration would be poor or nonexistant. There would not be any special effort made to detect Dendroctenus sp attacks, which could lead to catastrophic infestations. There is no risk with this alternative of increasing technological capabilities only to find that the mechanism to control exploitation does not exist. Access into the forest area would be less.

MAP No. 6: Patterns of Biological Diversity



PATTERNS OF BIOLOGICAL DIVERSITY
ALTERNATIVE A LA UNION

AGRICULTURAL USES
COMMUNITY WATERSHEDS
RIPARIAN ZONES
MATURE PINE ON STEEP SLOPES
PROTECTION FOREST RESERVES
COMMERCIAL PINE FOREST
LESS THAN 10 YRS
10 - 20 YRS
20 - 30 YRS
30 - 40 YRS

NATURAL VEGETATION/WILDLANDS

No specific protection would exist for the broadleaf forests. As populations increase and spread out the broadleaf forest would eventually deteriorate and disappear. The diversity of species in the area would be greatly reduced, and some extinction, particularly if endemic pines now exist on mountains, would undoubtedly occur.

WILDLIFE AND FISHERIES

Wildlife would continue to be scarce in pine and dry forests. Hunting pressures would increase as populations increase and spread out. As habitat is degaded or eliminated, extinctions would occur. Frequent fires would provide new sprouts and palatable grasses for grazing animals such as deer. If streams and rivers become heavily silted, fish populations would decline. Habitat occurring downstream could be damaged due to uncontrolled sedimentation following poor logging and agricultural practices. Deforestation could cause rivers to dry up seasonably, killing fish populations and stressing other wildlife. The most remote areas and the steepest slopes might continue to be unexploited, creating effective reserve areas.

AIR QUALITY

Air quality would continue to be affected by seasonal burning.

SOCIAL AND ECONOMIC - LA UNION - ALTERNATIVE A

Social, economic and institutional /administrative feasibility of the FDP is discussed in detail in the project paper (5). This section summarizes the principal social and economic effects identified for each of the alternatives regarding the La Union FMU. Macro-economic effects have been discussed previously in section (III) and the economic analysis of the project paper.

ECONOMIC DEVELOPMENT

The FDP will have a positive economic effect by increasing employment opportunities and income for local people based on small scale forest industries and work in forestry. These positive effects will be felt over long periods of time, as sustainable forestry is developed. These positive effects will generate improved social and cultural conditions and fuel the development of public services. The dispersed nature of forest management/logging should result in both the social and economic benefits being spread out geographically.

SOCIAL AND CULTURAL DEVELOPMENT

The relative static population of La Union would grow with increased economic opportunities derived from this project. New regional highways being built

will facilitate immigration into the FMU, but a series of mitigative measures directed at controlling spontaneous colonization and stabilizing land use in accordance to land use capabilities will be implemented (see section on colonization).

TRANSPORTATION AND PUBLIC SERVICES

There will be no direct benefits as a result of this proposal, however as a spontaneous outgrowth of the economic reactivation in the area, improvements in public services are expected. Some realistic expectations would include improvement in health services, education, water quality, and public transportation. Electrification could accompany increased affluence. Public health is expected to improve because of increasing incomes, better nutritional practices and management of municipal water supplies. Safety in logging operations should improve with better training, better vehicle maintenance, and restrictions on steep slopes. The need for local health care may decrease, while access by public transportation to existing hospitals may increase. Campesino groups formed through the project would be encouraged to expand their interests to include public services for their communities.

SOCIAL AND ECONOMIC

ECONOMIC DEVELOPMENT

Campesinos would continue to live at the subsistence level. Cottage industries, agroforestry and small business would not be promoted. Credit would not be available. The opportunity for better distribution of wealth would be lost. In the lower Aguan Valley, changes in water availability, caused by deforestation near La Union, could greatly affect the agricultural economy.

SOCIO/CULTURAL DEVELOPMENT

The traditional campesino lifestyle would be preserved. However, this includes subsistence living, high infant mortality, low life expectancy and poor education. The opportunity to improve the income and indirectly other aspects of their lives, would be lost. They would retain a higher degree on personal freedom concerning forest use. Incentives for population stability would not exist. Colonization could expand, causing more rapid depletion of the resources. There would not be any increase in employment expected.

TRANSPORTATION AND PUBLIC WORKS

The expected indirect benefits of the project, such as electrification, would not happen as rapidly.

OTHER RESOURCES

LAND USE AND REGULATION

Current trends would continue, degrading the natural resources at a steady pace. Land use would continue to change from forested land to agriculture and abandoned fields.

TOURISM AND RECREATION

Tourism is not a major issue, because of La Union's distance from population centers. Local recreation would continue. Opportunities for future development of tourism or recreation sites might be lost without the formal establishment of reserve areas.

ARCHAEOLOGICAL, CULTURAL AND HISTORIC RESOURCES

There are no known archaeological, cultural or historic sites in La Union management area.

VISUAL RESOURCES

This is not an important issue with the campesinos at this time. The view would change over time from forested mountains to cutover slopes possibly with crops planted. This could well be the preferred view to the campesinos.

POSSIBLE CONFLICTS BETWEEN PROPOSED ACTION AND THE OBJECTIVES/ACTIONS OF OTHER ORGANIZATIONS AND AGENCIES OF THE GOH.

Potential exists for conflict in a number of areas, as described below. Project staff should actively pursue more in-depth information regarding these activities and seek to implement measures to prevent or minimize conflict.

ALTERNATIVE A - WITH FDP

Road Construction

At least two major highways are being introduced into the project area of La Union. The GOH is constructing the La Union-Mame highway being funded by IDB, and the YODECO logging company is constructing the Yoro-Mangulile main haul road to gain access to the La Union forest reserve. Both of these roads will open the La Union FMU up to increased settlement pressures, as well as cause direct environmental impact in parts of the proposed project area. These roads will allow thru traffic to transit to and from the north coast and to an from Yoro.

IHCAFE

The USAID/H financed IHCAFE Project is active in the El Dictamo area, to the northwest of La Union, within the FMU. As pointed out in the AHE environmental report (1), the IHCAFE program has led to the expansion of coffee farming and deforestation of broadleaf forest in environmentally

289

fragile areas. To avoid further destruction of forest resources in the proposed wildland area of Montana La Muralla-El Armado-El Boqueron, as well as contamination impacts from unrestricted use of agrochemicals and dumping of coffee wastes in streams, environmental controls need to be implemented.

Logging Concessions-Pre Project

Two small concessions for forest harvest within the project area will be operational in La Union in the near future. The YODECO concession near Mangulile is estimated at 400 hectares and is for 20,000 m3 of stumpage. The Cerro Verde operation of Luis Velasquez is near El Rosario and holds a COHDEFOR concession of 2,000 hectares. As soon as possible, the management of these concessions should be made compatible with and a part of the forest management plan to be developed for the La Union FMU.

INA Directed Colonizations

E.A. work has not identified any INA directed colonization projects for the La Union area, however, that possibility could always arise. As described in this chapter's section on colonization impacts, an agreement should be signed between INA and COHDEFOR to avoid any potential impacts of planned settlements within La Union and other FMUs.

Military Actions

A large military base exists in Yoro to the west of the project area, but well within the secondary area of influence of the project. Military maneuvers and other types of actions have had detrimental effects on forest resources in other parts of the country, such as the recent forest fires that occurred in La Mosquitia. Other cases have occurred where military operations have caused suspension or disruption of civilian activities and forestry operations. This could probably be avoided with proper communication and regulation of military activities within FMUs.

ALTERNATIVE B "NO ACTION"

Roads

With No Action Alternative restriction on roading and related interinstitutional cooperation would not be necessary.

IHCAFE with the No Action Alternative IHCAFE would probably not be restricted and reoriented in its actions. As an environmental consequence continued deforestation of highland broadleaf forests and contamination of the municipal water supply of Mangulile by agrochemicals and coffee wastes could be expected.

Logging Concessions. The No Action Alternative would probably result in a progressive utilization of the forest resources of the area by large loggers such as YODECO and Luis Velasquez. A significant percentage of the cleared forest production lands would be converted into traditional agricultural and

grazing uses and timber resources would be degraded or lost. Without regulation, logging would probably continue with highgrading of adjacent broadleaf forests.

INA - Directed Colonizations - There would be no need for restrictions nor interinstitutional coordination.

Military Actions: ibid.

INSTITUTIONAL ROLES AND CAPACITIES FOR PROJECT IMPLEMENTATION

COHDEFOR

COHDEFOR's role and capabilities, as the lead GOH counterpart organization, are described in detail in the project paper. COHDEFOR, in summary, will be primarily responsible for regulating, overseeing, coordinating and, in some instances, executing most project activities. Major coordination efforts will take place with the forestry private sector, AHE, and the Ministry of Natural Resources. This assessment will attempt to point out limitations in the current project design and the potential environmental consequences of such constraints. Corrective and mitigative measures are given in chapter VI.

COHDEFOR will be responsible for the implementation of the stumpage and valuation system; the planning and supervision of FMUs; and the regulation and supervision of private sector road construction and logging operations. Failure to design and implement environmental regulations and controls related to any of these actions would lead to serious environmental degradation and resource depletion. Although sufficient trained foresters exist in Honduras, gaps exist in certain areas of expertise and training is required. Areas where little expertise exists include environmental assessment and mitigation; also, field implementation of environmentally sound logging and road construction practices is generally lacking. Staff and technical assistance resources to attend to these deficiencies are needed.

AHE

The Honduran Ecological Association is a private non-profit institution comprised of scientists and conservation minded individuals.

As the only respected private voluntary conservation organization in Honduras they have a special role to play in education, consciousness raising and "stewardship". Given AHE's experience in environmental studies and assessment and in the establishment and protection of natural areas they are also an appropriate institution for work in these areas.

RENARE

RENARE, the renewable natural resources division of the Ministry of Natural Resources, is officially charged with management of wildlife, fisheries, parks and reserves, and other renewable natural resources. RENARE's budget and

291

technical capabilities have been seriously limited in the past making it difficult to comply with its legal/administrative mandate. In order to not further complicate project implementation RENARE would be encouraged to participate cooperatively with COHDEFOR, AHE and other principal implementing organizations.

Role of Peace Corps

Peace Corps volunteers have had a long and successful history of assistance in forestry and natural resources management in Honduras with COHDEFOR, RENARE, AHE and various other institutions. The opportunity to utilize Peace Corps volunteers should be explored if special technical assistance needs arise that can be adequately be attended to with project resources.

SECONDARY EFFECTS RESULTING FROM THE ALTERNATIVES AND THEIR SIGNIFICANCE

Alternative A will result in the input of capital, income and employment generation and several other socio-economic benefits to local economies that will have an indirect effect of encouraging emigration into FMUs. Improved road networks and logging will make these public forest lands more subject to spontaneous colonization, extensive grazing of forest lands and other environmentally undesirable land/resource uses. The potential environmental consequences of this include the conversion of forest lands, as well as direct environmental impacts such as burning, overgrazing and soil and water impacts. The potentially negative effects, both environmental and socio-economic, were analyzed by COHDEFOR and the E.A. team and several control measures were identified which would be implemented as part of the FDP. These mitigating measures are outlined here and discussed in further detail in Chapter VI.

- A memorandum between COHDEFOR and other institutions involved with the colonization issue would be signed establishing interinstitutional cooperation mechanisms to avoid spontaneous settlement in FMU areas. These institutions include: COHDEFOR, IHCAFE, INA, SECOPT, RENARE, and AHE.

- COHDEFOR would assign to the small forestry work groups the responsibility of management and protection of specific portions of their FMU. Provide them economic incentives and encourage community participation.

- COHDEFOR would make a declaration of project intent and restriction of beneficiaries to the resident population of FMU. Employment and other economic resources of the FDP would be directed toward this resident target population.

- Control posts and guards would be set up COHDEFOR to monitor traffic on forest roads and prevent settlement.

- The use of forest roads that do not interconnect communities would be regulated.

- There would be placement of signs in FMUs prohibiting colonization and fencing of national forest lands.

- COHDEFOR would establish of a specific agreement with INA to avoid directed colonizations in FMUs.

- FDP staff would seek ways to encourage participation of other private and non-governmental groups in the management and protection of natural areas and wildlands.

Colonization/Secondary Effects - No Action

To cite the La Union FMU as an example, current trands are toward traditional forest harvest operations of a magnitude that would log the area over completely in the next 5-10 years. Two concessions already exist in the area and much pressure is being put on COHDEFOR to accelerate permits/concessions in the area. With the limited current capability of COHDEFOR to regulate forest management and mitigate environmental impacts, massive forest land conversion to agricultural uses would be expected along with wild fires, and poor forest regeneration. In the medium to long term, colonization impacts would be expected to be greater; no institutional regulatory capability within COHDEFOR would be developed and a host of negative environmental impacts would result.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

ALTERNATIVE A

Logging and forest industries are energy intensive operations. The trade-off to be analyzed under Alternative A is the expenditure of energy with regulation and control of forest management and effective regeneration of secondary forests vs. energy expenditure with traditional harvest and milling operations. Alternative A would be conservative of energy in several ways:

- energy investments for timber harvest would be recompensed by more efficient forest regeneration yielding future energy savings;

- more efficient milling operations would conserve an estimated 20% of the timber resource with equal or lower energy consumption by modernized and more efficient equipment;

- improved road construction and maintenance would represent substantial energy savings. Traditional means of logging with oxen which consumes less energy would be employed in both alternatives.

ALTERNATIVE "NO ACTION"

Alternative B would generally consume more energy for the opposite reasons expressed above. Furthermore, the No Action Alternative would result in other

resources being depleted or degraded in the long term. Soil and water resources would be degraded and downstream ecosystems would be altered permanently. The loss of biological diversity, including rare and endangered species of plants and animals that otherwise would have been protected in reserve and wildland areas, are other irretrievable commitments of resources resulting from "no action".

EXPENDITURE OF NATURAL OR DEPLETABLE RESOURCES

Alternative A

The FDP would result in the alternation of most commercial pine forests in the FMUs from generally unmanaged stands to managed forests with a mix of different age classes. This does not represent a major expenditure but rather a change in the nature of the resource.

Alternative B

No action would probably result in a long-term depletion of the forest resources of the FMUs associated with general depletion or loss of the related resources of soil, water, wildlife, fisheries and biological diversity.

V. MITIGATING MEASURES

Institutional Reorientation of COHDEFOR

This will include extensive training both in Honduras and outside the country. Some specific training goals should be in environmental impact assessment and mitigation, logging engineering, and road construction. Silvicultural training and certification of foresters is necessary to assure that prescriptions are properly done and environmentally sound. Women will have equal opportunities for training. Stumpage pricing and forest valuation will be reoriented to promote better timber utilization. Environmental regulations will be required in management planning, contracts and supervision. Assistance for developing environmental assessments, i.e. baseline studies, will be requested from AHE. Guidelines for writing environmental examinations and assessments will be standardized throughout the country. Assessments for project funded FMUs will be subject to approval by COHDEFOR and AID.

Private Sector Strengthening and Public Awareness

An innovative environmental education program will be launched to increase public awareness of the value of sustainable forest management. Training will be made available to help timber operators make their businesses more efficient and environmentally sound. Possible training subjects would be timber cruising, safety, vehicle equipment maintenance, and implementation of environmental guidelines for forest harvest. Assistance will also be available for writing credit proposals and environmental assessments. Women will have equal opportunities for assistance and training.

Forest Management of Selected Areas

Project Areas

Overall procedures, management plans, silvicultural prescriptions, road plans, environmental guidelines, etc. will all work to improve management practices and verify that forestry activities are environmentally sound.

Management Activities of La Union

Forest Management Plan and Contract Development

A Forest Management Plan (FMP) will be developed and approved before logging or road construction begins. This plan will be prepared by professional foresters in COHDEFOR with the assistance of the special technical assistance consultants for A.I.D. The FMP will address environmental issues and concerns about timber, wildlife, soils, water, human populations, etc. and will include precise mitigating measures to be taken for the protection of the resources. This plan will require that the La Union Unit be separated into manageable blocks or compartments, and that individualized silvicultural prescriptions will be written for each compartment. The prescription process would include on-the-ground stand examination and a written document, subject to approval, dictating very precise management activities for the area. Timber sale

contracts will be developed which will be adapted to specific site requirements concerning logging equipment, slope restrictions, road placement and construction, skid trail placement, etc. Constructions (camps and field facilities) will be designed by approved engineers and architects and constructed/supervised according to regulations the of GOH.

Fire Management

As described in the project paper, a great deal of emphasis will be on prevention and control of wildfires. Programs for community education will increase public awareness, while incentive programs will make fire prevention profitable. Towers, fire fighting crews and improved access will make initial attack faster. In order to reduce access for arsonists, some roads may need to be gated, restricting ingress except to fire fighters. Other roads will probably be closed to all traffic. Access to fire towers in the protection areas will be by footpaths.

Pest Control

Frequent monitoring for Dendroctenus sp. bark beetle, and immediate action upon detection, will reduce the chances of a catastrophic infestation. Guidelines for action will be dealt with in the Management Plan, but should include cutting down and, if possible, utilizing infested trees immediately. Under the current project design procurement or use of pesticides is not contemplated. If this condition changes, no pesticides will be bought or used until an E.A. amendment is submitted and approved by AID/W, LAC/DR/CEO.

Management by Life Zones

There are six life zones where pine, principally P. oocarpa, does not occur at commercial levels. These life zones require special management strategies, as outlined below (see Map No. 2).

Life Zone	Management Strategy Proposed
1. Tropical Dry Forest	Agroforestry and community forestry applications; riverbank protection
2. Subtropical Moist Forest transition to Dry	Agroforestry and community forestry applications; protection of riparian vegetation
3. Subtropical Wet Forest	Protect this forest in the headwaters of critical watersheds, such as Camote and La Habana/Habanita. Few or no pine found here. For large area southwest of Mangulile, protect with agroforestry and improved grazing practices.
4. Lower Montane Subtropical Wet Forest, transition to Moist	Protection of P. maximinoi and P. Tecumamani genetic resources; forms part of recommended forest reserve.
5. Lower Montane Subtropical Wet Forest	Cloud forest area, protection as hydrologic and forest reserve.

6. Lower Montane Subtropical Moist Forest	Protection of P. maximinoi genetic resources; forms part of recommended forest reserve.

The three Lower Montane Forest Life Zones should be protected for both their bio-diversity and hydrologic values. These forest form the headwaters of most of the major rivers of the area and provide critical water quality and flow regulation functions.

Community Watershed Management

Each of the four community watershed units will have a management plan with very specific directives. There will be a need in some of the areas for land reclamation. All area plans will address the issues of road building and logging. Regulations in the community watersheds will be stricter than in the general forest area. Roads will be built with gentle grades, water bars, and road dips (coweeta dips) in order to prevent erosion. Road banks will be shaped for least erosion. Where erosion is beginning, or in areas of serious erosion potential, roads will be seeded with native grasses. Logging on steep slopes will be restricted and slopes which are too steep to support logging will be eliminated from logging plans. (These excessive slopes should be conservative, - 40%, until it has been observed that logging on steeper slopes does not cause resource damage). Streamsides will be protected from logging and logging debris; regular and low water bridges rather than stream bottom fords will be used to cross streams. Roads will not be built immediately along streams. Methods of periodic water quality and discharge testing will be built into the watershed management plans and will monitor short-term hydrologic impacts of logging and roading.

Protection Forests

Hydrological/Biological Reserves

These areas are permanently established (by presidential or congressional decree) highland broadleaf forests. There will be no road building, no timber harvesting, and no hunting in these reserves. Wildland recreational use would not be excluded from these areas; however, significant use of this type is not anticipated. There are no plans at this time for developed tourism in the reserves, however if a demand develops, tourism will need to be as carefully planned as other aspects of the project. These reserves would be available for visits by researchers and students.

Production Reserve Forests (Over 50% slope)

Forests occurring on slopes too steep to be logged with existing technology will be reserved to protect soil and water resources. These areas will be identified during the field examinations for the silvicultural prescription. Until technological capabilities are such that steeper slopes can be managed without resource damage, logging will be prohibited. The introduction of high lead cable systems, for example, could change this designation. Roads could pass through some of these areas, however, measures such as waterbars, slope

restrictions, etc. would have to be clearly outlined and strictly enforced. An estimated upper limit of 50% is set for tractor operator safety. Trials carried out during the development of the FMP for the four soil types of the La Union FMU could cause that restriction to be adjusted downward.

Forest Road and Trail Development

An impact evaluation matrix illustrating the activities and environmental effects of forest roads is presented in Appendix E. This is to serve as a guideline during road design, construction and maintenance activities to orient and carry out environmental mitigation, control and monitoring functions.

The Forest Management Plan will address the question of road building restrictions. A civil engineer will work with foresters to provide maximum resource protection. COHDEFOR has general guidelines for forest road construction, but these will be adapted to the La Union Management Unit. All forest roads and trails should be constructed, improved and maintained using strict measures to avoid erosion and accelerated runoff. COHDEFOR has agreed to use and adapt technical specifications and norms developed by the AID/SECOPT Rural Roads Project (No. 522-T-035). These will be employed in the absence of more appropriate and improved forest road technical guidelines.

To the degree possible, road activities involving earth movement should be carried out in the dry season when erosion risk is least. Only emergency maintenance work should be performed in the wet season.

The stability and protective surfaces (vegetation and erosion pavements) of existing forest roads (i.e. the Camino Real from La Union to Jano via Laguna de Aguacatal) should be maintained during road improvement work. Most existing roads in the project area require resurfacing, drainage and erosion control work but not major realignment or upgrading. Unless there is a strong justification, stable road bases and cut and fill banks should not be disturbed. Unstable cut and fill banks of both existing and new roads and trails should be stabilized with appropriate mechanical and/or vegetative controls.

Permanent drainage and water control structures are required for all permanent forest roads. Designs should be based on a realistic analysis of rainfall and runoff potentials; and structures, once built, should be cleaned and maintained frequently. Temporary roads and trails should utilize effective temporary structures for water control. Weather stations need to be set up at the outset of the project to begin providing the weather information required for proper design of drainage structures.

Forest roads will not be built fording streams, or along streambanks. Bridges will be built for all permanent forest roads where stream or river crossing is necessary. At the first sign of erosion, remedial action will be taken (probably to establish vegetative cover of native grasses on the road). Exotic plants will not be used without a thorough analysis of the environmental implications. To control the environmentally critical possibility of unregulated colonization along the roads, a road closure strategy will be worked out to reduce the possibility of spontaneous colonization and destructive access into the forest.

Silvicultural Practices

A silvicultural prescription will be written for each area before treatment begins, however, there are some guidelines common to all stands. Regeneration will be closely monitored to assure establishment of a new stand following the harvest of timber. If seedling survival is inadequate, interplanting or direct seeding will be accomplished during the next growing season (and repeated as necessary). Site preparation for natural seed fall will be accomplished, if determined to be necessary, before the start of the first growing season after the regeneration cut. Site preparation will generally be either prescribed burning, or manual scarification. Mechanical site preparation would not be appropriate on these slopes and a source of income generation for local people would be lost. Periodic cleanings and thinnings will be prescribed and implemented to promote healthy stands with good spacing. In both thinnings and seed tree cuts, the best dominant trees will be left standing; the suppressed and poorly-formed trees will be cut. Optimum size of regeneration cuts needs to be determined. Placement of regeneration cuts in noncontinuous blocks will be most beneficial to wildlife, and will help prevent infestations by bark beetles or fusiform rust. Prescribed burning strategies for site preparation, fuel reduction and habitat improvement will be determined in the Forest Management Plan.

Forest Harvesting Practices

The two biggest risks during logging are damage to the soil and water resource, and damage to the residual trees. Most of the mitigation needed will be included in the standard timber sale contract. These contracts will be flexible enough that special adaptations can be made for any site. Restrictions concerning wet-weather work, skidding on steep slopes, placement and treatment of log landings, stream protection and erosion control will be standard contract specifications. The Forest Management Plan will determine stump heights. Slopes that are inoperable because of steepness will be managed as reserves. Slope restrictions need to be defined, based on soil characteristics and past practices, during the development of the FMP. Boundaries of the hydrological/biological reserves will be clearly marked. No harvesting or roading will be allowed within those boundaries. Special harvesting restrictions will be prescribed within the community watersheds. Hydrologic and water quality impacts of logging and roading will be monitored. Skidding will follow contours or, if that is not possible, logs will be skidded uphill.

Wildlife Management

Silvicultural prescriptions will have to address the question of wildlife habitat, and determine whether there is a decline in the general condition of the habitat. Wildlife inventory and habitat studies will be carried out during the FMU planning activity. Wildlife management measures identified at this stage will be implemented as part of the forest management operation. Treatments to improve habitat will be prescribed in those documents. Hunting will be controlled throughout the management area, and prohibited in the protection forests. Regeneration cuts will be of an appropriate size and placement to enhance wildlife habitat, and create a more diverse environment.

Den trees and snags will be left during logging operations. Riparian zones will be protected throughout the management unit. Funds will be provided for research grants for wildlife inventory and studies.

Biological Diversity

In addition to the wildlands management to be carried out which contributes to the conservation of bio-diversity, the opportunity exists for the protection of rare forest genetic resources. Stands of P. Maximinoi and P. patula subs. Tecumumani occur in the Lower Montane moist and wet Life Zones of the project area. These being uncommon and valuable species of pine with a high demand for their seed, COHDEFOR will inventory and establish protected stands, and organize the production and sale of seed, if economically feasible.

Measures taken to enhance habitat and increase wildlife populations will contribute to biological diversity. Reserving some forest types while improving age class distribution in others will increase the plant diversity in the FMU.

Cultural and Archaeological Resources

No exceptional cultural or archeological resources are known to occur in the project area. If discovered during the events of project implementation COHDEFOR should contact the Honduran Anthropological Institute immediately and take steps to assess and conserve, as appropriate, such resources.

Small Farmer Income Generation

Small business and cottage industries, the same as the timber operators, will be required to maximize wood utilization. Some marketing research should be done to help campesinos find a product with high value and stable demand which could be produced with the talent and materials they have available. Special efforts will be made to include women in all aspects of campesino involvement. Environmental education will increase the campesino's awareness of the forest and encourage a community effort to protect the resources.

Improved Agricultural and Grazing Practices

Grazing practices will be changed, prohibiting grazing in seedling stands. Campesinos will not be allowed to build fences on public land. Agricultural land use will be restricted to appropriate sites. Exotic plants will not be introduced into the area unless an adequate environmental assessment has determined such an introduction to be environmentally sound. Agroforestry specifications will include erosion control and soil stabilization and small farmers will be encouraged to establish farm woodlots and utilize trees in their farming systems whenever possible.

Strengthening Forest Industry

Credit

Credit will be granted only for operations which comply with COHDEFOR contracts and environmental standards. A management proposal will be required with each credit application; each proposal will be verified to be environmentally sound before the applicant is determined to be eligible for credit. The credit recipient will be closely monitored for compliance to contract specifications. Women will have equal access to credit. Credit will not be given for procurement of logging equipment. A change in this part of the project would require further documentation/assessment.

Colonization

An increased opportunity for spontaneous colonization will be created by the two new roads being built independent of the Forestry Development Project. In order to control and limit spontaneous colonization, strict regulations will be developed and enforced from the very beginning of the project. Roads which do not connect two communities will have traffic regulated by guard houses and gates. Temporary roads will be closed to traffic. Signs prohibiting colonization will be posted, and fencing will be constructed in problem areas. Existing campesino groups will be involved in forest protection in an effort to encourage peer control. Government agencies will play important roles in restricting colonization. After identifying the current population COHDEFOR will issue a declaration restricting benefits to those persons presently living in the FMU on non-forested land. A memorandum of understanding will be developed between AID and BID, COHDEFOR, AHE, RENARE, INA, SECOPT, etc. to avoid conflict with the actions of other institutions. An agreement will be signed with INA prohibiting any directed colonization projects. AHE and RENARE will be given important roles in the protection of natural areas and wildlands. Many of these measures have been employed by COHDEFOR in other areas, specifically San Esteban, with relative success. In the event that the above measures prove ineffective in controlling colonization COHDEFOR would take action through other appropriate government agencies to prevent further entry and/or evict new colonizers.

Applied Research and Demonstration

As part of the responsibility of COHDEFOR and the project technical assistance team, applied research and demonstrations will be carried out concerning logging practices and forest roads. Erosion/runoff plots will be established for typical slope categories for the four principal series of soils that occur in the project area. Likewise, "typical" logging practices to be employed in the project will be tested for different slope and soil conditions (i.e. compare tractor, to tractor and skidder, to oxen). The impacts in terms of erosion, forest regeneration, water quality, runoff and other important parameters will be observed and demonstrated. This will serve as a mechanism for refinement of the forest management activity of the project and also a training tool for project technical staff, loggers and the local community. COHDEFOR should explore possibilities of carrying out these research, training and demonstration activities in collaboration with ESNACIFOR, and transferring knowledge and findings to other parts of the country.

As part of COHDEFOR's applied research trials on vegetative (and perhaps mechanical) erosion control measures suitable for logging and roading practices will be carried out. Likewise, these trials will serve a training and demonstration function and can de done cooperatively with ESNACIFOR staff.

Research and inventory work on wildlife and rare and endangered species of plants and animals that occur in the La Union FMU are needed. A research grant will be offered competitively to find the most capable organization to do the work. Likely candidates include UNAH, CURLA, AHE and RENARE. This research could be carried out cooperatively with an international conservation organization such as IUCN, WWF or The Nature Conservancy. Additional resources could be sought via the USAID biological diversity initiative.

Training and Technical Assistance

ESNACIFOR, in cooperation with COHDEFOR FMU staff and with the assistance of specialists, will give a series of short courses and workshops on environmental planning and management, the implementation of environmental guidelines for forest harvest, and environmental assessment and impact mitigation techniques. The details of these training events are summarized in the training plan of the project paper, and will be designed to support the training needs of the three major FDP components.

Environmental Education for Local Communities and Nationwide

As a mechanism to further involve the local community in project implementation and educate them specifically regarding the environmental management aspects of the project, AHE or some other capable organization will carry out an environmental education campaign. This activity will focus on the community watershed and wildlands management components in addition to the community's participation in forest management. Also, funds will be provided for a national program of environmental education focusing on forestry and related environmental management techniques. This campaign would help the public better understand the rationale behind the FDP and how sound forest management can contribute to environmental protection and rural development.

Technical Assistance

COHDEFOR will contribute to the FDP over the life of the project a highly trained environmental specialist with skills in logging and forest management who will be responsible for developing and implementing environmental regulations and guidelines for logging and roading. However, it is recognized that COHDEFOR has limited field experience in alternative logging systems, environmental controls, logging practices and forest roads (design, construction, maintenance). An additional 3 person months of expatriate short-term technical assistance will be provided with expertise in these fields of special environmental concern to assure that the recommendations of this E.A. are implemented satisfactorily.

Project Management

Given the quantity and complexity of the environmental actions required in the FDP, USAID should designate one senior US specialist with professional experience in natural resource management, to supervise and assure implementation of mitigative measures and E.A. recommendations. Possible candidates could be the project manager or a senior member of the T.A. team.

Environmental Assessments and Baseline Studies

Forty thousand dollars in grant funds and $40,000 in GOH counterpart funds will be provided to perform baseline studies and environmental assessments for areas II and III. These funds will be in addition to the $100,000 assigned to the AHE for environmental education and assessment assistance.

Given the experience and capability of the USDA Forest Service in subject matters relating to forest management and environmental protection, USAID/H should consider utilizing the USFS via the AID/W FSP to meet overall project technical assistance needs.

CONDITIONS PRECEDENT, COVENANTS AND PROJECT EVALUATION

CONDITIONS PRECEDENT

Given the nature of the project and its potential for significant impact, the following conditions are established:

A. The two wildland areas recommended as essential mitigative measures (Chapter VI) for the La Union FMU must be legally decreed, permanently protected and delineated in the field with boundary markers prior to dispersal of funds for logging or road construction in the project area.

B. The AID regional environmental specialist and LAC/CEO will review and approve the La Union Forestry Management Plan prior to its approval by AID and implementation by COHDEFOR. This review will evaluate the degree of compliance in the plan with the recommendations and conditions of this EA, especially regarding roading and logging practices. If necessary, additional environmental safeguards will be incorporated into the management plan at that time before proceeding with forest management and harvest operations.

C. An appropriate environmental analysis will be carried out by the regional environmental official for management areas II and III as they are identified and proposed for incorporation into the project and will be approved by the LAC/CEO. In a similar manner as for La Union, the mitigative measures and recommendations formulated in these E.A.s will need to be incorporated into the management plan prior to AID's review and approval of funds for forest management implementation.

COVENANTS

A. COHDEFOR agrees to use its best effort to insure that private loggers and sawmillers comply with the management practices and recommendations established in this E.A. and in the La Union and subsequent (ie., for Areas II and III) Forest Management Plans.

PROJECT MONITORING AND EVALUATION

A. The project must demonstrate "acceptable" levels of forest regeneration and appropriate management practices as outlined in this E.A. and the Forest Management Plan. Compliance with this condition will be measured periodically as an essential part of the project evaluations. If regeneration practices and/or management practices are determined to be unacceptable, further dispersal of project funds for the forest management component will be held up until compliance is obtained by COHDEFOR.

B. The regional environmental advisor and other environmental specialist(s) designated by the LAC/CEO, will participate in the periodic technical evaluations of the project to determine continued compliance with the conditions and recommendations of this E.A.

VII. LIST OF PREPARERS

The following is a list of individuals and organizations who contributed to the development of the Initial Environmental Evaluation (IEE), Scoping Exercise (SE) and/or the Environmental Assessment (EA):

1. Ramon Alvarez - Forestry Advisor, USAID/H, Tegucigalpa, Honduras (IEE, SE and EA)

2. Jim Barborak - Director Wildlands Management, CATIE, Turrialba, Costa Rica (SE)

3. Ernesto Galvez - Rural Sociology for AHE, Tegucigalpa, (IEE)

4. Carlos Guillen - Watershed for AHE, Tegucigalpa, (IEE)

5. Manuel Hernandez - Chief Advisor to the Minister of Natural Resources, Tegucigalpa (IEE, SE and EA)

6. James Hester - Chief Environmental Officer (LAC/DR, USAID, Washington, D.C. (IEE, SE and EA)

7. Kathryn Hunter - Latin America Coordinator, Forestry Support Program, USFS, Washington, D.C. (SE and EA)

8. William Kashack - Head Program and Finance Officer, USAID/H, Tegucigalpa (IEE and EA)

9. Mateo Molina - Head Forest Management Department, COHDEFOR, Tegucigalpa (IEE, SE and EA)

10. Rigoberto Romero - Executive Director, AHE, Tegucigalpa (IEE, SE and EA)

11. Manuel Rosales - Soils and Land Use for AHE, Tegucigalpa (IEE)

12. Henry Tschinkel - Regional Forestry Advisor, USAID/ROCAP, San Jose, Costa Rica (IEE, SE)

13. Efrain Villeda - Ecology and Wildlands for AHE, Tegucigalpa, (IEE)

14. John Warren - Natural Resources Advisor, USAID/H, Tegucigalpa (IEE, SE and EA)

15. Frank Zadroga - Regional Environmental Management Specialist, USAID/ROCAP, San Jose, Costa Rica (Coordinator for IEE, SE and EA)

APPENDIX A

LIFE ZONES AND SPECIES LISTS

Common Local Name	Scientific Name
500-700 m.a.s.l., in Tropical Dry Forest:	
Guarumo	Cecropia peltata
Jagua	Genipa caruto
Salamo	Calycophyllum candidiscimm
Cedro	Cendrela mexicana
Macuelizo	Tabebuia rosea
Caulote	Guazuma ulmifolia
Guama	Inga vera
Higos	Ficus sp.
Ceiba	Ceiba pentandra
Guanacaste	Enterolobium cyclocarpum
Carao	Cassia grandis
700-1500 m.a.s.l., in Subtropical Moist Forest:	
Pino	Pinus oocarpa
Pinabete	Pinus maximinoi
Roble	Quercus sp.
Encino	Quercus oleoides
Manzano rosa	Eugenia jambos
Guayaba	Psidium sp.
Liquidambar	Liquidambar styraciflua
600-1500 m.a.s.l., in Subtropical Wet Forest:	
Mario	Calophyllum brasiliense
Cedro Espino	Bombacopsis sp.
Liquidambar	Liquidambar styraciflua
Anona	Annona muricata
Guayabillo	Terminalia lucida
Laurel	Cordia alliodora
Jobo	Spondias sp.
Majao	Heliocarpus sp.
Zorro	Alvaradoa amorphoides

1500-2064 m.a.s.l., in Subtropical Lower Montane Wet Forest:

Pino	Pinus patula subs p. tecumumani
Roble, bellota	Quercus skinneri
Aguacatillo	Persea sp.
Aguacatillo	Nectandra spp.
Achiotillo	Bix orellana L.
Aniz - anicillo	Malpighia glabra 1.
Anona del Sur	Anona muricata L.
Carao	Cassia grandis
Cordoncillo	Piner aduncum L.
Capulin-Blanco	Trema micrantha (L.) Blume
Chaparro	Curatella americana L.
Cuero de Toro	Not identified
Cortez Blanco	Tabebuia palmeri Rosa
Cincho	Lonchocarpus rugosus Benth
Ceibo	Ceiba pentandra (L.) Gaertn
Cedro	Cedrela mexicana
Cedro Espino	Bambacopsis sp.
Caleandro	Calliamdra houstoniana
Chute	Not identified
Cola de Pava	Cupania dentata. DC.
Buey	Not identified
Grado	Not identified
Guama	Inga vera
Guarumo	Cecropia peltata
Guanacaste	Enterolobium cyclocarpum
Guayaba comun	Terminalia lucida
Jobo de Montana	Spondias sp.
Jagua	Genipa caruto
Jobo	Spondias sp.
Locomico	Not identified
Masicaran	Not identified
Mimbre	Salix sp.

301

Macuelizo	Tabebuia rosea
Majao	Heliocarpus donnell - shithii Rose
Manzana Rosa	Eugenia Jambos
Pepe nance	Clethra macrophylla mart. y gal.
Nogal falso	Not identified
Quina	Picramnia antidesha. swartz.
Quiebra Muela	Not identified
Salamo	Calycophyllum candidissimum (vahl) D.C.)
Tapaculo-caulote negro	Guazuma ulmifolia. Camb
Varios ficus	Ficus spp.
Zorro	Alvaradoa amorphoides. Liebm

APPENDIX B

GLOSSARY

GLOSSARY - LIST OF ACRONYMS

CBH	Central Bank of Honduras
AMI	Integrated Management Areas
COHDEFOR	Honduran Corporation for Forestry Development
DBH	diameter at breast height
ESNACIFOR	National Forestry School
FAO	Food and Agricultural Organization (United Nations)
FMP	Forest Management Plan
FMU	Forest Management Unit
GOH	Government of Honduras
GDP	Gross Domestic Product
HA.	Hectare - 2.5 acres
IEE	Initial Environmental Examination
INA	National Agrarian Institute
INFONAC	National Forests Inventory Unit (COHDEFOR)
MBF	metric board foot
m.b.f.	million board feet
MNR	Ministry of Natural Resources
NGO	Non-Government Organization
NRMP	Natural Resources Management Project
PB	Private Bank
PIU	Project Implementation Unit
PVO	Private Voluntary Organization
SECOPT	Secretary of Public Works and Transportation
USAID	United States Agency for International Development
USAID/H	United States Agency for International Development/Honduras
USFS	United States Forest Service
USPAC	United States Presidential Agricultural Commission
WID	Women in Development
WMU	Watershed Management Units
PACD	Project Assistance Completion Date
LOP	Life of Project
AHE	Honduran Ecological Association
E.A.	Environmental Assessment (per Section 216.3 of AID environmental procedures)
FDP	Forestry Development Project (522-0246)
PP	Project Paper
PID	Project Implementation Document
ERR	Economic Rate of Return
CORFINO	Corporacion Forestal Industrial de
IDB	Interamerican Development Bank
IHCAFE	Honduran Coffee Institute
IDA	Institute for Agrarian Development

APPENDIX C

BIBLIOGRAPHY

(1) AHE Report: Asociacion Hondurena de Ecologia, December 1986. "Identification de Posible Impacto Ambiental Causado por el Proyecto de Desarrollo Forestal en el Area de la Union-Olancho": 80 pages plus annexes.

(2) Honduras CEP, 1981 AID/H. August, 1982. Honduras - Country Environmental Profile. A Field Study (Contractor J.R.B. Associates) 183 pages.

(3) FAO. August, 1981. "La Cuenca Hidrografica del Rio Aguan - Analisis de los Recursos Fisicos y Recomendaciones para la Ordenacion". FAO Project Hon/77/005 - Pieter Van Ginnehen. 102 pages plus appendixes.

(4) COHDEFOR, March, 1987. "Estrategia del Intervencion del Area de Manejo La Union, Olancho. Proyecto de Desarrollo Forestal. COHDEFOR/AID. 87 pages plus annexes.

(5) Agency for International Development, July, 1987. Forestry Development Project Paper. p. 92 and 13 annexes.

(6) Agency for International Development, May, 1987. Initial Environmental Examination of USAID/H Forestry Development Project, p. 28 and 3 annexes.

(7) "Analisis Funcional de la COHDEFOR" Francisco Ortuño Medina and Dr. Ingeniero de Montes, Sept. 1986.

(8) "Analisis Administrativo de la Corporacion Hondureña de Desarrollo Forestal" by Francisco Ortuño Medina.

(9) "Informe de la Comision de RR.NN. sobre la Situacion de la COHDEFOR" President of the Commission de Recursos Naturales, Oct. 1986.

(10) "COHDEFOR's Commercial Dept. - An Analysis of Responsibilities, Activities, Structure and Additional Costs" Peter Drake, Dec. 1986.

(11) "A new Strategy for Marketing the Sawnwood of Honduras" Winrock Int'l, July, 1984.

(12) "Honduras Pine Export Strategy" by Peter Drake, Dec. 1986.

(13) "Financing of the Private Forest Industry in Honduras and Recommendations" Tomas T. Membreño, Feb., 1987.

(14) "Assessment of Forest Resource Development in Honduras" Edward P. Cliff. April, 1980.

(15) "Residual Value Stumpage Appraisal Design" Winrock Int'l, July, 1984.

(16) "Honduran Forest Resource Development" Dr. Vern Yerkes, Nov. 1981.

(17) "Forestry Activities and Deforestation Problems in Developing Countries" USDA Forest Products Laboratory, July, 1980.

(18) "Report of the U.S. Presidential Agricultural Mission to Honduras" Richard O. Wheeler, Leader, Nov. 1982.

(19) "National Development Strategy 1986 - 1989" a summary of GOH document prepared by Vicente Diaz, ODP, USAID.

(20) "El Sector Forestal de Honduras" Banco Interamericano de Desarrollo, June 1982.

AHE DESCRIPTIONS OF PROPOSED PROTECTION AREAS

4.3 Recomendaciones de Areas Silvestres:

En el área del proyecto forestal se encuentran dos zonas que reúnen méritos para ser declarados y protegidas como áreas silvestres.

4.3.1 Montaña la Muralla, Los Higuerales y Las Parras:

Esta zona al norte de la ciudad de La Unión es una montaña cubierta de bosque - latifoliado siempre-verde, que comienza a partir de los 1,500 metros de elevación. Es un bosque muy denso, poco intervenido con unos 60 Km^2 de área.

Es una masa forestal no estudiada, que tiene enorme importancia en el abastecimiento de agua a varios municipios: La Unión, al que provee de agua potable por

la subcuenca del Camalote, que se encuentra en estado virgen, muy protegida por su inaccesibilidad. Esto permite una producción constante de agua de buena calidad y cantidad. Hacia Mangulile provee de agua potable la quebrada La Habana, está muy intervenida en su cabecera, debido a la caficultura y a los potreros, es notable la contaminación del agua durante el período de corte y lavado del café.

Además de su importancia como fuente de agua, es un ecosistema que sirve de refugio a muchas especies, que ya son raras en otras partes del país, como el Quetzal, Dantos, Pavas, Monos, Ocelotes, Pumas, Tigres.

Límites:

Los límites de esta área deberán ser determinados por la cota de 1,800 metros de altura (bosque nublado). La declaración debe de estar a cargo de COHDEFOR y el manejo del área debe involucrar a RENARE y a la comunidad a través de la municipalidad de La Unión y Mangulile.

NUMERO:	20
NOMBRE:	Montañas La Muralla Los Higuerales
DEPARTAMENTO:	Olancho
LOCALIZACION:	8 km. lineales al Norte de La Unión. Hoja La Unión No. 2861 II.
DESCRIPCION:	La montaña, La Muralla, tiene un máximo de 1981 m. y 4 Km^2 de área arriba de la cota 1,800 m. y la montana de Las Parras, tiene un pico máximo de 2,064 m. y un área de 9 Km^2 arriba de los 1,800 m. El área total entre los 3 picos es de 16 Km^2 sobre los 1,800 m.

38

IMPORTANCIA: Se estima en por lo menos 15 comunidades, las que dependen de este bosque nublado, para obtener su agua potable.

CATEGORIA: Refugio de Vida Silvestre

SITUACION: Se desconoce el nivel de destrucción actual

LIMITES: Se recomienda usar la cota de los 1,800 m. como límites para el refugio con un área total estimada en 70 Km^2, que incluye una zona de amortiguamiento periférica.

ESTACION	ELEVACION(M)	RUMBO (o)	DISTANCIA	OBSERVACIONES
1-2	1,328	N 80° 15'0	5,550	
2-3	1,565	N 62 45'0	2,400	
3-4	1,573	N 38 00'0	2,850	
4-5	1,575	N 88 45'0	8,000	
5-6	1,446	N 59 15'0	5,900	
6-7	1,507	S 79 00'E	5,500	
7-1	1,111	S 63 00'0	13,650	

4.3.2 Montaña El Armado-Roupeculo y El Poquerón

Esta montaña, al Suroeste de la unidad es una área cubierta de bosque latifoliado de unos 55 Km^2. Terreno ubicado sobre una formación de calisas, con topografía kárstica, con abundantes colinas, lo que dificulta mucho el acceso

haciéndolo peligroso e imposible para maquinaria de extracción forestal. Esta área no tiene drenaje superficial, solo drenaje subterráneo, lo que hace suponer la existencia de cavernas en el borde de la montaña. En el borde de la montaña hay zonas de pendientes muy escarpadas, con más del 60%, que hacen imposible su aprovechamiento. Se recomienda un reconocimiento de esta área en compañía de las municipalidades de El Rosario y Yocón.

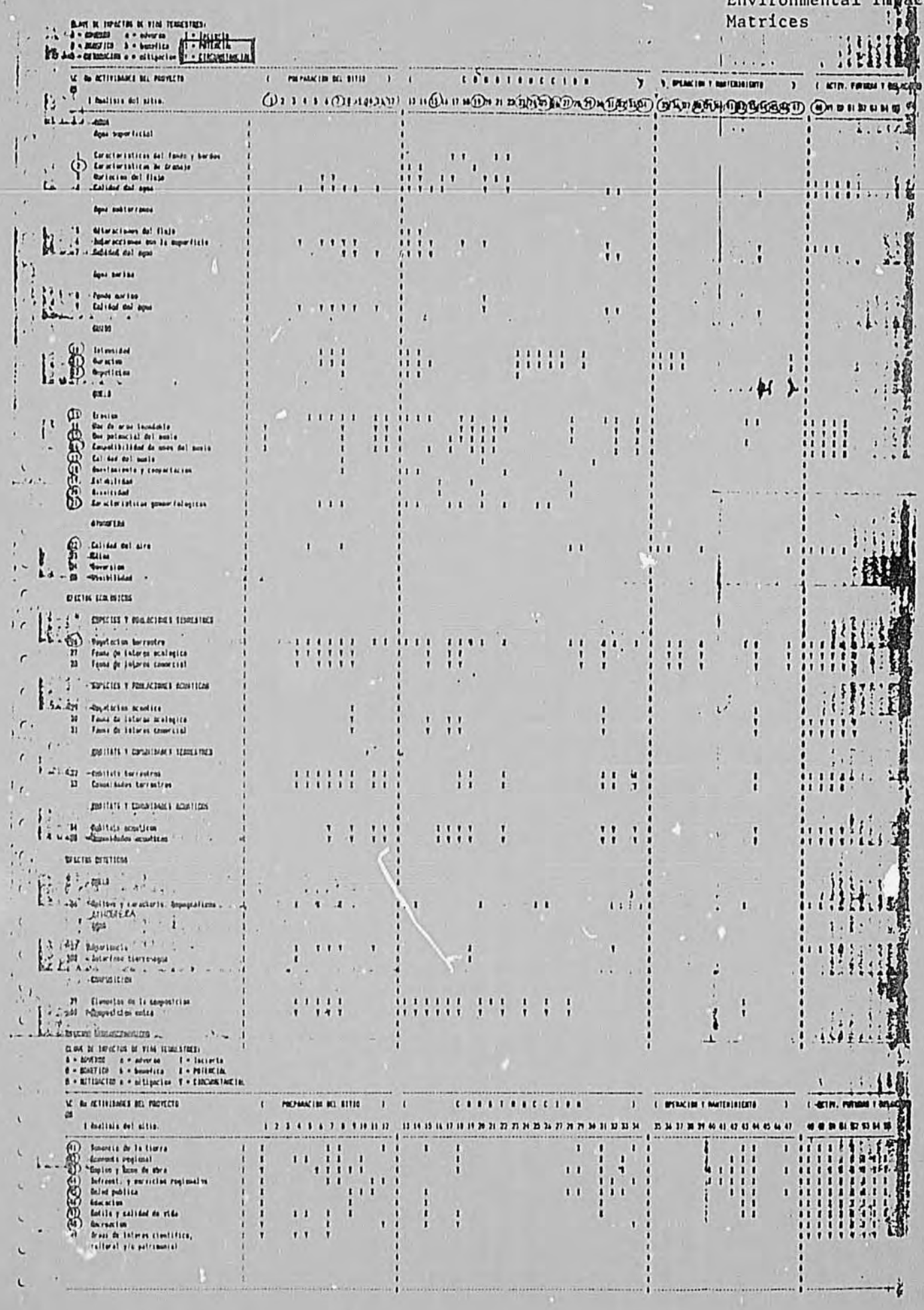
Estas dos áreas han sido propuestas por la Asociación Hondureña de Ecología, al Congreso Nacional en su propuesta de protección de los bosques nublados de Honduras; como la número 19 y 20.

NUMERO:	19
NOMBRE:	Montaña El Armado
DEPARTAMENTO:	Olancho
LOCALIZACION:	Al Noroeste de Juticalpa, cerca del Departamento de Francisco Morazán, Hoja: Montaña de La Flor # 2869 IV.
DESCRIPCION:	Un solo pico de 1923 m de altura máxima y un (1) Km^2 de área por arriba de los 1,800 m.
IMPORTANCIA:	Por lo menos 15 communidades dependen de esta área para obtener agua potable.
CATEGORIA:	Refugio de Vida Silvestre
SITUACION:	Se desconoce el nivel de destrucción actual.

LIMITES: Se recomienda usar la cota de los 1800 m como límite de la zona intocable y los siguientes límites para el refugio con un área estimada en 35 Km^2, que incluyen una zona periférica de amortiguamiento.

ESTACION	ELEVACION(m)	RUMBOS (o)	DISTANCIAS(m)	OBSERVACIONES
1-2	1,565	S 37° 30' E	6150	
2-3	1,600	S 20° 30' 0	1700	
3-4	1,826	N 88° 45' 0	3850	
4-5	1,681	N 79° 15' 0	2750	
5-6	1,829	N 08° 30' 0	4650	
6-1	1,743	N 72° 00' E	4300	

APPENDIX E
Environmental Impact
Matrices



PROYECTOS DE VIAS TERRESTRES

No ACTIVIDADES DEL PROYECTO

Diseño { Capacidad de drenaje / puntos de precipitación, escorrentía? / Avenidas, sistemas de [illegible] / especificaciones / limitaciones de acceso con [illegible]

PREPARACION DEL SITIO DONDE SE ASENTARA LA OBRA

1 Analisis del sitio.
2 Pruebas de suelo.
3 Pruebas hidrologicas
4 Limpieza y desmonte.
5 Quema.
6 Uso de maquinaria.
7 Caminos provisionales o en desvio.
8 Explotacion de bancos de material.
9 Generacion de mano de obra.
10 Accidentes.
11 Manejo y disposicion final de desechos.
12 Abandono y rehabilitacion.

CONSTRUCCION

13 Excavacion y nivelacion del terreno.
14 Cortes y rellenos.
15 Campamentos provisionales
16 Puentes permanentes.
17 Canales.
18 Desvio de rios o corrientes.
19 Alteracion de drenaje.
20 Tuneles.
21 Bordos.
22 Terraplenes.
23 Maquinaria y equipo pesado.
24 Acarreo de material.
25 Maquinaria y equipo ligero.
26 Diseminacion.
27 Consolidacion.
28 Deslizamientos.
29 Alteracion de los patrones de transito.
30 Tratamiento al suelo.
31 Generacion de mano de obra.
32 Manejo y disposicion final de desechos.
33 Accidentes y contingencias.
34 Abandono y rehabilitacion.
Estabilización de taludes ?

OPERACION Y MANTENIMIENTO

35 Trafico normal.
36 Trafico en dias y horas pico.
37 Emision de ruido.
38 Vibraciones.
39 Contaminantes atmosfericos.
40 Mantenimiento preventivo y correctivo.
41 Limpieza.

42 Accidentes y contingencias.
43 Derrumbes.
44 Generacion de mano de obra.
45 Abandono o usos secundarios.
46 Derrames.
47 Alteraciones a los patrones de transito.

ACTIVIDADES FUTURAS Y RELACIONADAS

48 Carreteras
49 Desarrollo de hoteleria
50 Desarrollo urbano
51 Saneamiento basico
52 Servicios de energia electrica
53 Servicios de transmisiones
54 Abasto alimentario
55 Servicios de salud

56
57
58
59
60

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

CLAVE DE LA EVALUACION

A = ADVERSO MUY SIGNIFICATIVO
a = ADVERSO SIGNIFICATIVO
B = BENEFICO MUY SIGNIFICATIVO
b = BENEFICO SIGNIFICATIVO
= NO EXISTE INTERACCION
M = EXISTE MEDIDA DE MITIGACION DE A
m = EXISTE MEDIDA DE MITIGACION DE a
I = INFORMACION INSUFICIENTE

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

[illegible]
A = adverso d = adversa I = Incierto
B = beneficio b = beneficio E = POTENCIAL
M = MITIGACION m = Mitigacion Y = CIRCUNSTANCIAL

Nº	ACTIVIDADES DEL PROYECTO / Elaboración Plan de Manejo Forestal	ACT. PARTICIPE	ACTIVIDADES DE CORTE Y RADICALES	REGENERACION DEL BOSQUE Y PROTECCION	URBANO
	EFECTOS AMBIENTALES	1 2 3 4 5	13 14 18 19 20 26 27 28 29 30 31 32 33 34	35 36 37 38 39 40 41 42 43 44 45 46 47	56 57 58 59 60
	EFECTOS FISICOQUIMICOS	ACTACTACTACTACT	ACTACTACTACTACTACTACTACTACTACTACTACT	ACTACTACTACTACTACTACTACTACTACTACTACT	ACTACTACTACTACT
	AGUA				
	Agua superficial				
1	Características del fondo y bordes		Y		
2	Características de drenaje		I I I I		
3	Variación del flujo		I Y Y Y		
4	Calidad del agua	I	I Y I Y I I	I	
	Agua subterránea				
5	Alteraciones del flujo		I Y I		
6	Interacciones con la superficie	Y	I Y Y Y Y I		
7	Calidad del agua		I Y I I Y I	Y Y	
	Agua marina				
8	Fondo marino		Y		
9	Calidad del agua	Y	Y Y I	Y	
	SUELO				
10	Intensidad		I I I I I I I	I I I I	I
11	Duración		I I I I I I I	I I I I	I
12	Repetición		I I I		
	SUELO				
13	Erosión	Y	I I I Y I I I I I I I	I I	
14	Uso de área inundable	I	Y Y Y Y I I		
15	Uso potencial del suelo	I	Y Y I I I I		
16	Compatibilidad de usos del suelo	I	I I I I I	I	
17	Calidad del suelo		I		
18	Acentuación y compactación		I I I I		
19	Estabilidad		I		
20	Basicidad		I I		
21	Características geomorfológicas		I I I I I I		
	ATMOSFERA				
22	Calidad del aire	I	I I	I I I I	I
23	Clima				
24	Inversión				
25	Visibilidad				
	EFECTOS ECOLOGICOS				
	ESPECIES Y POBLACIONES TERRESTRES				
26	Vegetación terrestre	I I	I I I I I I I I I I I I I	I I I I I I I	
27	Fauna de interes ecologico	Y Y	Y Y Y	Y Y Y Y Y Y	
28	Fauna de interes comercial	Y	Y Y I	Y Y Y Y Y Y	
	ESPECIES Y POBLACIONES ACUATICAS				
29	Vegetación acuatica		I	I	
30	Fauna de interes ecologico		Y I	I	
31	Fauna de interes comercial		Y I	I	
	HABITATS Y COMUNIDADES TERRESTRES				
32	Habitats terrestres	I I	I I I I I I	I	
33	Comunidades terrestres	I I	I I I I I I	I	
	HABITATS Y COMUNIDADES ACUATICAS				
34	Habitats acuaticos		Y Y Y Y Y	Y	
35	Comunidades acuaticas		Y Y Y Y Y	Y	
	EFECTOS ESTETICOS				
	SUELO				
36	Relieve y caracteris. topograficas	I	I I I I I	I	
	AGUA				
37	Apariencia	I	I Y		
38	Interfase tierra-agua	I	I		
	COMPOSICION				
39	Elementos de la composicion	I I	I I I I I I I I	I	
40	Composicion unica	Y	I Y Y Y Y Y	Y	
	EFECTOS SOCIOECONOMICOS				
41	Tenencia de la tierra	I	I I I I I	I I I I	
42	Economia regional	I I I	I I I I I	I I I I	
43	Empleo y mano de obra	I	I I I I I I I I I I I I I	I I I I I I	
44	Infraest. y servicios regionales	I	I I I I I I I I I I I I I	I I I I I I	
45	Salud publica	I	I I I I I I I I I I I I I	I I I I I I	
46	Educación	I	I I I I I I I I I I I I I	I I I I I I	
47	Estilo y calidad de vida	I I I	I I I I I I I I I I I I I	I I I I I I	
48	Recreación	Y	I I I I I I I I I I I I I	I I I I I I	
49	Areas de interes cientifico, cultural y/o patrimonial	Y Y Y	I I I I I I I I I I I I I	I I I I I I	

(RESUMEN)

ANALISIS ADMINISTRATIVO

POR: Ing. Manuel Hernandez, MRN

La Corporación Hondureña de Desarrollo Forestal (COHDEFOR)

1. Organización:

a. Status Legal y Objetivos

La Corporación Hondureña de Desarrollo Forestal es una institución creada en 1974 mediante el Decreto Ley No. 103, Institución Semiautónoma, con Personalidad Jurídica y patrimonio propios; tiene por objeto hacer un aprovechamiento óptimo de los recursos forestales con que cuenta el país, asegurando la protección, mejora, conservación e incremento de los mismos. Sus responsabilidades incluyen el manejo de los bosques públicos y privados, el fomento a la industria primaria y de transformación, la exportación de la madera y su comercialización interna al por mayor; asimismo, especial énfasis se hace en la participación de los campesinos en actividades forestales y los beneficios derivados de la explotación forestal.

b. Status Financiera

En su autonomía la COHDEFOR puede adoptar las medidas indispensables para alcanzar los objetivos de la corporación, sometiéndo al Consejo Directivo los informes legales, técnicos y financieros que sean necesarios para adoptar acuerdos relacionados con las operaciones de COHDEFOR. Como parte de los Organos Directivos también existe un Comité Ejecutivo con funciones de apoyo administrativo y Organo de Dirección de la actividad comercial; dentro de este ámbito COHDEFOR, puede comprometer con razonable eficiencia sus recursos propios, firmar convenios, contratos y otros compromisos necesarios para la consecución de sus objetivos.

En términos generales, desconociendo las inversiones en empresas, en sus operaciones anuales COHDEFOR practicamente hubiese reportado utilidades cada año.

En el período 1982-1985 por concepto de exportación y tronconaje como fuentes principales de ingresos COHDEFOR recibió un promedio anual de Lps. 28.977.525 millones de lempiras. Como organismo autónomo debe financiar su gestión con sus propios ingresos y de acuerdo a las nuevas políticas dar atención prioritaria al manejo forestal. Se estima que la corporación estará en condiciones de asignar la contrapartida prevista para el proyecto forestal.

c. Esquema Organizativo y Personal

Desde el punto de vista organizacional COHDEFOR es dirigida por un Gerente General quien se reporta directamente al Consejo Directivo presidido por el Presidente Constitucional de la República (primer nivel), asimismo forman parte de los organos superiores, un Comité Ejecutivo que preside el Ministro de Recursos Naturales (segundo nivel) y una Gerencia y Subgerencia General (tercer nivel) asistidos por una compleja estructura, compuesta por servicios centrales (ubicados en Tegucigalpa y los servicios periféricos que corresponde a 9 regiones denominadas Distritos Forestales y la Escuela Nacional de Ciencias Forestales (ESNACIFOR). De acuerdo con la política y reestructura recientemente aprobada por el Consejo Directivo se producirá una descentralización del personal para reforzar las actividades de campo.

Se distinguen las categorías de: órganos operativos, normativos y de apoyo básico.

Las oficinas regionales dependerán jerarquicamente de la Gerencia General y funcionalmente de dos órganos normativos de los cuales el principal por su proyección nacional es el Departamento Forestal con tres sec

ciones: Manejo Forestal, Industrial Forestal y Promoción y Extensión Forestal. Asimismo reviste mucha importancia el Departamento de Finanzas y Administración como responsable del apoyo básico funcional (contabilidad general, presupuesto, manejo de efectivo, servicios generales y personal).

Las operaciones a nivel nacional se desarrollan a través de nueve regiones: Olancho, El Paraíso, Francisco Morazán, Comayagua, Copán (Ocotepeque y Lempira), Yoro, Nor-occidental, la Mosquitia y la región latifoliada (Atlántida, Colón y parte de Olancho), responsables por desarrollar los programas y proyectos en sus respectivas jurisdicciones.

Las Regiones cuentan en la actualidad con un total de 195 técnicos forestales mientras que en los Servicios Centrales existen 119 técnicos (previo a la reestructura).

Se considera adecuado el número de técnicos forestales sin embargo se nota deficiencias en su distribución y en la formación y disponibilidad de buenos Agentes de Extensión y Especialistas en campos específicos como la silvicultura, la mensuración y entomología forestal.

Los Distritos Forestales a su vez se dividen en áreas administrativas llamadas Unidades de Manejo que cuentan con limitada capacidad técnica y administrativa y actuan bajo la Dirección de un técnico forestal que a su vez se somete a la Dirección y coordinación de un Jefe Regional; Este mecanismo podría afectar la agilidad que requiere el desarrollo de una Unidad de Manejo que se estime como prioritaria. El organigrama adjunto muestra la estructura reciente aprobada por el Consejo Directivo. COHDEFOR cuenta con suficiente personal técnico para asignar a proyectos específicos, estando su estabilidad más limitada por las condiciones del empleo que por su disponibilidad. Asimismo existe la flexibilidad para capacitar al personal y substituirlos por personal

de igual o similar capacidad; El personal técnico tiene generalmente conocimiento elemental del idioma inglés.

2. La Administración

a. Delegación de Autoridad

A pesar de que los servicios periféricos (regiones) son los órganos realmente operativos de la institución, solamente reciben entre el 25% y el 50% de los recursos presupuestarios asignados a los Servicios Centrales (Tegucigalpa). Asimismo las funciones asignadas a los Jefes de regiones forestales son mínimas; A pesar de su calificación profesional son un eslabon subordinado a las decisiones centrales con delegación muy limitada tanto en la toma de decisiones como en la aplicación de su capacidad profesional; consecuentemente, las limitaciones a nivel de Universidad de Manejo son mayores pues sus funciones son basicamente las de la región pero a nivel de menor jerarquía.

b. Experiencia y Capacidad de los Administradores

La Corporación cuenta con personal técnico con alguna experiencia y especialidad principalmente en "Manejo Forestal" notándose debilidad en otras áreas técnicas específicas para el manejo forestal a nivel nacional.

El personal a cargo de los Distritos Forestales y Unidades de Manejo son técnicos forestales, generalmente con cierta experiencia técnica forestal pero escasa capacidad en el campo administrativo. Esta situación se empeora dada la alta rotación del personal en posiciones de dirección a nivel central y particularmente en los Distritos Forestales, situación que se dá por influencias políticas y la falta de incentivo relacionados a las responsabilidades delegadas y ubicación geográfica.

3. Capacidad para Desarrollar el Proyecto

Las renovadas políticas y reestructura aprobada recientemente por el Consejo Directivo de COHDEFOR, ofrecen un marco adecuado para corregir deficiencias detectadas en el campo administrativo e introducir incentivos necesarios que permitan hacer una adecuada selección del personal técnico y administrativo, mediante la aplicación de la reestructura de la Corporación y la implementación del Proyecto en 1987; COHDEFOR cuenta con personal técnico y administrativo del cual se puede hacer la selección principal del personal necesario para la ejecución del proyecto, tanto en su proyección nacional como en el manejo forestal en la Unidad de la Unión, Olancho.

Especial importancia debe darse a la organización, mecanismos y delegación de autoridad necesarios para administrar la Unidad de la Unión de acuerdo a los objetivos e insumos previstos por el proyecto. Dados sus objetivos y el presupuesto asignado, el Proyecto debe ser administrado con mayor independencia que las Unidades de Manejo a nivel nacional, a fin de asegurar la acción oportuna y el suministro adecuado de Bienes y Servicios en y del Proyecto; se identifica la necesidad de revisar y actualizar los procedimientos administrativos vigentes, adaptándolos a las necesidades del proyecto, poner en practica la administración de personal y sus componentes de selección, inducción, capacitación y actualizar el manual de puestos y salarios, como elementos de una política de estabilidad en los cargos; fomentar la capacitación local a través de apoyo a la Escuela Nacional de Ciencias Forestales (ESNACIFOR) dirigida a Maestros, Técnicos y otras necesidades específicas del Proyecto; y capacitar a nivel superior personal seleccionado tanto técnico como administrativo en áreas específi-

cas preidentificadas. Tradicionalmente se ha dado prioridad a la capacitación técnica forestal sintiéndose la necesidad de continuar una estrategia de capacitación y apoyo que incluye las áreas Financiera y Administrativa a fin de asegurar el soporte competente a las operaciones de campo. Asimismo asegurarse que las personas seleccionadas llenen los requisitos requeridos para el cargo y pueda utilizarse como elemento condicionante a participar en el proyecto y sus beneficios, (capacitación, etc.), la entrega de servicios profesionales al proyecto por tiempo determinado.

ANNEX M

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSIBLE
OUTPUT 1: Full industrial scale sales of pine timber in Honduras made using stumpage fees and valuation systems and logging according to timber sale regulations and environmental technical guidelines.								
1.1 Develop tentative guidelines for estimating timber in sale areas and develop sale regulations	xxxx							T.A. team
1.2 Train technicians in forest inventory and preparing tracts for sale of standing timber in La Union		xx						ESNACIFOR + T.A. team
1.3 Implement and test standing timber sale procedure in La Union on pilot basis			xxx					Forestry Dept.
1.4 Give one-week course in "Classification of Pine Forests"								ESNACIFOR + consultant
1.5 Select and process 15 individuals for B.S., M.S. and 3rd-degree training abroad, and send to U.S. universities	oppppppp	oppppppp	oppppppp	oppppppp	oppppppp	oppppppp		Training Coordinator
1.6 Revise guidelines, computer software and prepare training manuals for estimating and selling standing timber, based on pilot experience		xxx						T.A. team
1.7 Train trainers in preparing tracts for sale of standing timber throughout Honduras (10 courses; see Training Plan)			xxxxpppp	pppppppp	pppppppp	pppppppp		ESNACIFOR + T.A. team
1.8 Educate private loggers and forest industrials in functioning and applications of new sale systems (7 courses; see Training Plan)			pppppp	pppppp				T.A. team
1.9 Implement sales of standing pine timber throughout Honduras			xxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	Forestry Dept.
1.10 Control and perfect new sales procedures			xxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxx xxxxxx	Forestry Dept. + T.A. team
1.11 Analyze previous stumpage valuation studies to determine real cost value of standing timber	xxxxx							Forestry Dept. + T.A. team
1.12 Propose pricing alternatives and establish a clear stumpage pricing policy nationwide		xxx						Forestry Dept. + T.A. team
1.13 Develop guidelines, computer software and training manuals for pricing of standing timber			xxx					T.A. team
1.14 Train public and private sector technicians in pricing of standing timber and sale procedures (7 courses; see Training Plan)			ppp	pppppppp				ESNACIFOR + T.A. team
1.15 Implement new pricing procedures for standing pine timber nationwide				xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	Forestry Dept.
1.16 Update aerial photographs of commercial pine forests					xxx			Forestry Dept.
1.17 Control and perfect timber sale and pricing procedures				xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	Forestry Dept.

FF-JUL-87 LOTUS IMPLAN.WK1 xxxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSIBLE
1.18 Supervise logging areas and exercise environmental controls		xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	Forestry Dept.
1.19 Update environmental and technical guidelines for logging practices and roading			xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	Forestry Dept. & T.A. team

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
OUTPUT 2: All lumber export handled and negotiated by private sector with appropriate monetary benefit accruing to national government								
2.1 Contract TA for design of export control mechanisms and monitoring procedures (4 consultants)	xxx							USAID Project Officer
2.2 Revise regulations pertaining to the quality control and export of lumber and other wood products	xxxxx							Commercial Dept. + T.A.
2.3 Train COHDEFOR personnel in quality control, market analysis, promotion, documentation, procedures and other aspects of export control	xxxx	xxx						Contracted T.A.
2.4 Prepare manuals indicating how to comply with COHDEFOR export regulations	xxx	xxx						Commercial Dept. + T.A.
2.5 Maintain private exporters informed of regulations and their implications		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Commercial Dept.
2.6 Control quality, quantity and prices of lumber and other wood product exports according to established procedures		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Commercial Dept.
2.7 Maintain knowledge of market prices and trends through study of pertinent published information, statistics and visits to markets	xxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Commercial Dept.
2.8 Promote Honduran lumber and wood products in foreign markets		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	AMADHO
2.9 Carry out studies of market alternatives for Honduran sawmillers		pppppppppp	pppppppppp	pppppppppp	pppppppppp			AMADHO
OUTPUT 3: COHDEFOR covering its operational costs and functioning efficiently according to modern, appropriate operating procedures								
3.1 Develop estimates of expected revenues from stumpage	xx	xx	xx	xx	xx	xx	xx	Admin.& Finance Dept.
3.2 Develop estimates of expected revenues to COHDEFOR from export commissions	xx	xx	xx	xx	xx	xx	xx	Admin.& Finance Dept.
3.3 Develop preliminary budget for COHDEFOR operations	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	Admin.& Finance Dept.
3.4 Analyse preliminary budget and expected revenues in order to define strategy to develop a balanced budget	xx	xx	xx	xx	xx	xx	xx	Admin.& Finance Dept.
3.5 Develop revised budget and submit for approval	x	xx	xx	xx	xx	xx	x	Admin.& Finance Dept.
3.6 Recommend more efficient operating, personnel management and accounting procedures	xxx							Contracted TA
3.7 Prepare manuals for implementing procedures	xxxxx							Admin&Fin.Dept.+ contracted TA
3.8 Train COHDEFOR personnel in correct operating procedures (21 courses; see Training Plan)	pp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	ESNACIFOR
3.9 Implement modified procedures		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Admin.& Finance Dept.
3.10 Evaluate procedures and revise manuals			xx			xx		Admin.& Finance Dept.
3.11 Select and process 50 individuals for mid-level training and send to ESNACIFOR	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Training Coordinator
3.12 Select and process 10 individuals for B.S., M.S. and Ph.D. degree training and send to U.S. universities	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp			
3.13 Select and process 7 individuals for Peace Corps	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Training Coordinator

09-Jul-87 LOTUS IMPLAN.WKS xxxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
overseas remote sensing course								
3.14 Offer 31 in country short-courses on various subjects (see Training Plan	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp			Training Coord. + consultants
OUTPUT 4: Forest management plans for La Union, AREA2 and AREA3 completed and operational								
4.1 Determine outline, content, schedule and responsible technicians for management plan (La Union, AREA2, AREA3 respectively					xx			Chief Forest Mgt. Unit
4.2 Compile existing information and carry out field studies	xxxxx		xxxxx			xxxxx		Chief Forest Mgt. Unit
4.3 Present and interpret tentative forest management plan to local population and obtain feedback	xxxx		xxx			xxx		Chief Forest Mgt. Unit
4.4 Draft forest management plan	xxx		xxx			xxx		Chief Forest Mgt. Unit
4.5 Develop watershed management plans for community watersheds and protection plans for wildland areas	xxxxxx		xxxxxx			xxxxxx		Chief Forest Mgt. Unit + national consultants
4.6 Carry out environmental assessments for AREA2 & AREA3 respectively			xxx			xxx		Regional Environ.Mgt.Specialst
4.7 Review and approve forest management plan, including environmental aspects	xx		xx			xx		COHDEFOR Gen.Manager & USAID
4.8 Prepare and approve work plan and budget for first year, based on management plan	xx		xx			xx		Chief Forest Mgt. Unit & COHDEFOR Gen.Manager
4.9 Revise and update management plans that are in operation (La Union, AREA2)			xxxxxx			xxxxxx		Chief Forest Mgt. Unit
4.10 Offer in-country short-courses in photo interpretation (4 courses) and social aspects (4 courses)	ppp	pppppppppp	pppppppppp	pppppppppp				Training Coord. + ESNACIFOR
4.11 Applied field research to solve environmental management problems		xxxxxxxxxxx	xx-xxxxxxxx					TA team, COHDEFOR & ESNACIFOR
OUTPUT 5: La Union and AREA2 forests protected against damage from wildfire, grazing, land clearing and pests								
5.1 Organize and equip fire crews, lookouts and roving fire patrols according to tentative forest management plan	xxx			xxx				Protection Specialist
5.2 Deploy fire crews, lookouts and roving patrols	xxxx			xxxx				
5.3 Train technicians, fire crews, lookouts, and patrols in La Union and AREA2 in fire prevention, control and prescribed burning (22 courses; see Training Plan)	ppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	ESNACIFOR
5.4 Construct and repair fire lookout towers according to forest management plan		xxx	xxx	xxx	xxx	xxx	xxx	Protection Specialist
5.5 Expand two-way radio network		xxx		xxx				
5.6 Construct and maintain fire breaks according to forest management plan		xxx	xxx	xxx	xxx	xxx	xxx	Protection Specialist
5.7 Select, organize and equip COHDEFOR forest extensionist for La Union and AREA2 respectively		xxxx		xxxx				
5.8 Train forest extensionists (16 courses; see Training Plan)		pppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	ESNACIFOR
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Protection Specialist

08-Jul-87 LOTUS IMPLAN.WKS xxxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
7.5 Assure intensive protection of areas to be reforested (see Output 7)	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	Protection Specialist
7.6 Carry out regeneration assessments				pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Forest Manager/Silviculturist
7.7 Identify areas (hectares) to be planted or direct seeded				pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Chief Forest Mgt. Unit
7.8 Establish pine nurseries				xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	Forest Manager/Silviculturist
7.9 Produce pine seedlings				xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	Forest Manager/Silviculturist
7.10 Prepare sites and establish plantations and direct seeding					pppppppppppp	pppppppppppp	pppppppppppp	Forest Manager/Silviculturist
7.11 Maintain plantations and direct seeding sites								

OUTPUT 8: Local population in La Union and AREA2 deriving significant and sustained income from forest based industries and activities

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
8.1 Carry out one-week workshop with CO-DEFOR field personnel in La Union to prepare strategy and method of incorporating local population	x							Chief Forest Mgt. Unit & TA
8.2 Establish dialog with local inhabitants through meetings and informal contacts to ascertain their needs and determine possible approaches and contributions of project (La Union, AREA2, AREA3 respectively)	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx	Chief Forest Mgt. Unit & TA
8.3 Select and contract NGO to give TA to campesino forest utilization activities and industries	xxxxxx							USAID
8.4 Carry out baseline study on relevant socio-economic status of campesinos and develop method for measuring impact of project on local inhabitants (La Union, AREA2, AREA3 respectively)	xxxxxx		xxxxxx			xxxxxx		Contracted NGO
8.5 Carry out feasibility studies for forest utilization activities by campesinos: logging with oxen, railroad ties, charcoal, resination, products from small diameter logs, pit sawing, seed collection (La Union, AREA2, AREA3 respectively)	xxxxxx	xxxxxx	xxxxxx			xxxxxx		Contracted NGO
8.6 Organize and strengthen campesino groups for forest utilization		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxx xxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Contracted NGO
8.7 Draft regulations for use of rotating fund, for approval by USAID		xx						Contracted NGO
8.8 Create rotating fund for credit to campesino enterprises		xx						USAID

09-Jul-87 LOTUS IMPLAN.WK1 xxxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
8.9 Obtain credit, procure equipment, establish markets for campesino enterprises		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Contracted NGO
8.10 Train campesino groups in utilization activities, maintainance of forest utilization equipment and management of the enterprises		pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Contracted NGO
8.11 Initiate selected campesino forest utilization enterprises according to results of feasibility studies		pppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Contracted NGO
8.12 Carry out feasibility studies for rural secondary forest industries linked to sawmills (furniture, handicrafts, etc.)			xxxxxx			xxxxxx		Contracted NGO
8.13 [illegible]				[illegible]	[illegible]	[illegible]	[illegible]	Contracted NGO

8.14 Give technical and managerial support to campesino enterprises	xxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	xxxxxxxxxxxx	Contracted NGO
8.15 Monitor campesino enterprises and assure their compatibility with forest management plan	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Chief Forest Mgt. Unit & Co
8.16 Evaluate campesino enterprises, the impact of forest activities on baseline indicators (see 2.4) and suggest improvements and possible expansion			xxx			xxx		Contracted TA
OUTPUT 9: Agricultural and grazing practices in La Union and AREA2 improved and harmonized with forest management								
9.1 Recruit technical specialists and assign to NRMP for one month of orientation and training, aimed at facilitating transfer of experience	xxxx							Proj.Director
9.2 For each of three tentative extension agencies (Yocon, Mangulile, AREA2) carry out diagnosis, select techniques, prepare work plan, establish credit and subsidy regulations, install demo plots, identify local leaders and decide on sites of agencies	xxxx		xxx					NRMP Technical Specialists
9.3 Supervise and monitor progress of field activities		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Leader NRMP Tech. Specialists
9.4 Recruit and train extensionists for two agencies (Yocon, Mangulile) (See short-courses in Training Plan)	xxxxx							NRMP Technical Specialists
9.5 Recruit and train extensionists for AREA2 (See short-courses in Training Plan)			xxxx					NRMP Technical Specialists
9.6 Carry out campaign of animal vaccination and pest		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	NRMP Tech.Spec.+ Ext. Agents

08-Jul-87 LOTUS IMPLAN.WK5 xxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0241) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
control								
9.7 Provide and train campesinos to carry out soil conservation measures on crop land and agronomic techniques		xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.8 Promote range management and establishment of alternative feeding (rotation grazing, cut-and-carry, grasses, pasture improvement)		xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.9 Promote and train women to carry out home economic activities (home gardens, nutrition, cottage industries		xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.10 Select and train local farm leaders (22 courses + 6 orientational events; see Training Plan)		xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.11 Evaluate farm leaders and deploy as para-technicians			xxx			xxx		NRMP Tech.Spec.+ Ext. Agents
9.12 Select and process 4 individuals for B.S. and M.S. training abroad, and send to U.S. universities and CATIE	pppppppppp	pppppppppp	pppppppppp	pppppppppp				Training Coordinator
9.13 Carry out internal annual evaluation for Output 9		xx	xx	xx	xx	xx	xx	Proj.Dir.+ Consultant
OUTPUT 10. Better utilization of standing timber volume through economically and environmentally sound, and technically efficient logging and residue use								

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
5.19 Motivate and train in fire prevention and control, those campesino groups that are involved in forest utilization (28 courses; see Training Plan)	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	Protection Specialist
5.12 Carry out prescribed burns according to forest	xxx	xxx	xxx	xxx	xxx	xxx	xxx	Contracted FA

08-Jul-87 LOTUS IMPLAN.WK5 xxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
management plan								
5.11 Carry out on request or supervise controlled burns for farmers and farmers preparing land	xx	xx	xx	xx	xx	xx	xx	Protection Specialist
5.11 Carry out terrestrial and aerial reconnaissance for detection of pests	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Protection Specialist
5.12 Carry out sanitation cuts in areas affected by pest outbreaks	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Protection Specialist
5.13 Decree and protect wildland areas	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	Proj.Director
5.14 Monitor water quality	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Protection Specialist
5.15 Carry out environmental education on a nationwide basis in support of the project objectives	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	Natl. Secretaria de Ecologia
OUTPUT 6: Forest road system in La Union and AFE42 expanded and upgraded according to the levels indicated in the forest management plans								
6.1 For those roads and skid trails to be financed through timber sales, prepare detailed specifications to be included in sales contract, taking environmental considerations into account	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	COHDEFOR Engineer
6.2 Inspect roads and skid trails constructed by logger during logging operations and assure they meet specifications of timber sale contract	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	COHDEFOR Engineer
6.3 Contract local population for routine road maintainance by hand labor	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	Chief For.Mgt.Unit
6.4 Contract major road maintainance that requires machines	pppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	COHDEFOR Engineer
OUTPUT 7: Logged and understocked sites in La Union and AFE42 regenerated according to management plans								
7.1 Develop specifications for logging under the common site conditions and include them in timber sale contracts	xxx	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Chief Forest Mgt. Unit
7.2 Mark seed trees on timber sale areas	xxx	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Manager Silviculturist
7.3 Inspect logging operations for compliance with specifications; report infractions and have them corrected		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Manager Silviculturist
7.4 Identify areas to be regenerated and mark in the field		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Chief Forest Mgt. Unit

08-Jul-87 LOTUS IMPLAN.WK5 xxxx = continuous activity pppp = intermittent activity

within COHDEFOR for assisting both harvesting and sawmill operations (see II.1)								
10.2 Survey current practices in harvesting operations in Honduras (logging, equipment maintainance, residues use)	xxxxx	xxxxx						Forest Industry TA Unit
10.3 Select appropriate methods to improve utilization and test in actual practice	xxx	xxxxx	pppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
10.4 Prepare and upgrade simple manuals of procedures for selected practices	xxx	xxxxx	pppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
10.5 Upgrade qualifications of members of Forest Industries TA Unit through on-the-job training and study tour abroad (see Training Plan)	ppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
10.6 Carry out 10 training courses at ESNACIFOR on harvesting practices for forest industry (see Training Plan)		pppppppppp	pppppppppp	pppppppppp	pppppppppp			For.Industry TA Unit+ESNACIFOR

08-Jul-87 LOTUS IMPLAN.WIS xxxxx = continuous activity ppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
11.7 Provide continuous on-site technical assistance to selected harvesting operations in logging, equipment maintainance, environmental management and residue use	ppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.8 Carry out feasibility studies on logging residue use and promote the implementation of the viable alternatives	ppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.9 Monitor the technical and economic benefits due to the TA program		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.10 Develop mechanisms for the Unit to become financially self-supporting (see II.10)				xxxxxxxxxxx	xxxxxxxxxxx			Forest Industry TA Unit
OUTPUT II: Greater efficiency of sawmills								
11.1 Organize Forest Industries Technical Assistance Unit within COHDEFOR for assisting both harvesting and sawmill operations (sawmill maintainance, wood drying, timber handling, mill residue utilization) (see II.1)	xx							COHDEFOR Proj.Director
11.2 Survey current sawmill practices in Honduras	xxxxxx	xxxxx						Forest Industry TA Unit
11.3 Select appropriate methods to improve utilization and test in actual practice	xx	xxxxxxpppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.4 Prepare and upgrade simple manuals of procedures for selected practices		xxxxxxpppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.5 Upgrade qualifications of members of Forest Industries TA Unit through on-the-job training and a study tours abroad (see Training Plan)	ppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.6 Carry out 10 training courses at ESNACIFOR on sawmill practices for forest industry (see Training Plan)		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	For.Industry TA Unit+ESNACIFOR
11.7 Provide continuous on-site technical assistance to selected sawmills	ppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.8 Carry out feasibility studies on mill residue use and promote the implementation of the viable alternatives	ppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.9 Monitor the technical and economic benefits due to the TA program		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Forest Industry TA Unit
11.10 Develop mechanisms for the Unit to become financially self-supporting (see II.10)				xxxxxxxxxx	xxxxxxxxxx			Forest Industry TA Unit

8.8 Give technical and managerial support to campesino enterprises	xxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Contracted NGO
8.9 Monitor campesino enterprises and assess the compatibility with forest management plan	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Chief Forest Mgt. Unit & TA
8.10 Evaluate campesino enterprises, the impact on forest activities on baseline indicators and suggest improvements and possible expansion		xxx				xx		Contracted TA

OUTPUT 9: Agricultural and grazing practices in La Union and AREA2 improved and harmonized with forest management

9.1 Recruit technical specialists and assign to NRMP for one month of orientation and training, aimed at facilitating transfer of experience	xxx							Proj.Director
9.2 For each of three tentative extension agencies (Yocon, Mangulile, AREA2) carry out diagnosis, select techniques, prepare work plan, establish credit and subsidy regulations, install demo plots, identify local leaders and decide on sites of agencies	xxxx		xxx					NRMP Technical Specialists
9.3 Supervise and monitor progress of field activities		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	Leader NRMP Tech. Specialists
9.4 Recruit and train extensionists for two agencies (Yocon, Mangulile) (See short-courses in Training Plan)	xxxxxx							NRMP Technical Specialists
9.5 Recruit and train extensionists for AREA2 (See short-courses in Training Plan)			xxxx					NRMP Technical Specialists
9.6 Carry out campaign of animal vaccination and pest		pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	pppppppppp	NRMP Tech.Spec.+ Ext. Agents

08-Jul-87 LOTUS IMPLAN.WK1 xxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
outputs								
9.7 Promote and train campesinos to carry out soil conservation measures on crop land and agronomic techniques		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.8 Promote range management and establishment of alternative feeding (rotation grazing, cut-and-carry, grasses, pasture improvement)		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.9 Promote and train women to carry out home economic activities (home gardens, nutrition, cottage industries		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.10 Select and train local farm leaders (22 courses + 6 conjoint-training events; see Training Plan)		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	NRMP Tech.Spec.+ Ext. Agents
9.11 Evaluate farm leaders and employ as para-technicians			xxx		xxx			NRMP Tech.Spec.+ Ext. Agents
9.12 Select and process 4 individuals for B.S. and M.S. training abroad, and send to U.S. universities and CATIE	pppppppppp	pppppppppp	pppppppppp	pppppppppp				Training Coordinator
9.13 Carry out internal annual evaluation for Output 9		xx	xx	xx	xx	xx	xx	Proj.Dir.+ Consultant

OUTPUT 10. Better utilization of standing timber volume through economically and environmentally sound, and technically efficient logging and residue use

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
7.5 Assure intensive protection of areas to be regenerated (see Output 5)		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Protection Specialist
7.6 Carry out regeneration assessments				pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Forest Manager/Silviculturist
7.7 Identify areas that need to be planted or direct seeded				pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Chief Forest Mgt. Unit
7.8 Establish pine nursery				xxxx				
7.9 Produce pine seedlings				xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	Forest Manager/Silviculturist
7.10 Prepare sites and establish plantations and direct seeding				xxxx	xxxx	xxx	xxxx	Forest Manager/Silviculturist
7.11 Maintain plantations and direct seeding sites					pppppppppppp	pppppppppppp	pppppppppppp	Forest Manager/Silviculturist
OUTPUT 8: Local population in La Union and AREA2 deriving significant and sustained income from forest based industries and activities								
8.1 Carry out one-week workshop with COHDEFOR field personnel in La Union to prepare strategy and method of incorporating local population	x							Chief Forest Mgt. Unit & TA
8.2 Establish dialog with local inhabitants through meetings and informal contacts to acertain their needs and determine possible approaches and contributions of project (La Union, AREA2, AREA3 respectively)	xxxxxxx	xxxxx	xxxxxx	xxxxxx		xxxxxx	xxxxxx	Chief Forest Mgt. Unit & TA
8.3 Select and contract NGO to give TA to campesino forest utilization activities and industries	xxxxxx							USAID
8.4 Carry out baseline study on relevant socio-economic status of campesinos and develop method for measuring impact of project on local inhabitants (La Union, AREA2, AREA3 respectively)	xxxxxx		xxxxxx			xxxxxx		Contracted NGO
8.5 Carry out feasibility studies for forest utilization activities by campesinos: logging with oxen, railroad ties, charcoal, resination, products from small dimension logs, pit sawing, seed collection (La Union, AREA2, AREA3 respectively)	xxxxxx	xxxxx	xxxxxx			xxxxxx		Contracted NGO
8.6 Organize and strengthen campesino groups for forest utilization		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Contracted NGO
8.7 Draft regulations for use of rotating fund, for approval by USAID	xx							Contracted NGO
8.8 Create rotating fund for credit to campesino enterprises		xx						USAID

03-Jul-87 LOTUS IMPLAN.WKS

xxxxx = continuous activity pppp = intermittent activity

FORESTRY DEVELOPMENT PROJECT (522-0246) Implementation Plan

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	RESPONSABLE
8.9 Obtain credit, procure equipment, establish markets for campesino enterprises		xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	Contracted NGO
8.10 Train campesino groups in utilization activities, maintainance of forest utilization equipment and management of the enterprises		pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Contracted NGO
8.11 Initiate selected campesino forest utilization enterprises according to results of feasibility studies		ppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	pppppppppppp	Contracted NGO
8.12 Carry out feasibility studies for rural secondary forest industries linked to sawmills (furniture, handicrafts, etc.)			xxxxxx			xxxxxx		Contracted NGO
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Contracted NGO

BIBLIOGRAPHY

1. "A new Strategy for Marketing the Sawnwood of Honduras" Winrock Int'l, July, 1984.

2. "Análisis Administrativo de la Corporación Hondureña de Desarrollo Forestal" by Manuel Hernandez.

3. "Análisis Funcional de la COHDEFOR" Francisco Ortuño Medina and DR. Ingeniero de Montes, Sept. 1986.

4. "Assessment of Forest Resource Development in Honduras" Edward P. Cliff, April, 1980.

5. "COHDEFOR's Commercial Dept. - An Analysis of Responsibilities, Activities, Structure and Additional Costs" Peter Drake, Dec. 1986.

6. "El Sector Forestal de Honduras" Banco Interamericano de Desarrollo, June 1982.

7. "Estrategia de Intervención del Area de Manejo - La Unión, Olancho" COHDEFOR, March, 1987.

8. "Financing of the Private Forest Industry in Honduras and Recommendations" Tomas T. Membreño, Feb., 1987.

9. "Forestry Activities and Deforestation Problems in Developing Countries" USDA Forest Products Laboratory, July, 1980.

10. "Honduran Forest Resource Development" Dr. Vern Yerkes, Nov. 1981.

11. "Honduras - Country Environmental Profile, a Field Study" JRB Associates, 1981.

12. "Honduras Pine Export Strategy" by Peter Drake, Dec. 1986.

13. "Informe de la Comisión de RR.NN. sobre la Situación de la COHDEFOR" President of the Commission de Recursos Naturales, Oct. 1986.

14. "National Development Strategy 1986 - 1989" a summary of GOH document prepared by Vicente Díaz, ODP, USAID.

15. "Report of the U.S. Presidential Agricultural Mission to Honduras" Richard O. Wheeler, Leader, Nov. 1982.

16. "Residual Value Stumpage Appraisal Design" Winrock Int'l, July, 1984.