

UNCLASSIFIED

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

DOMINICAN REPUBLIC

PROJECT PAPER

FORESTRY MANAGEMENT

AID/LAC/P-183

Loan Number: 517-T-050
Project Number: 517-0173

UNCLASSIFIED

PROJECT DATA SHEET

1. TRANSACTION CODE

A - Add
 C - Change
 D - Delete

Amendment Number

DOCUMENT CODE

3

COUNTRY/ENTITY
 Dominican Republic

3. PROJECT NUMBER
 517-0173

4. BUREAU/OFFICE
 Latin America and the Caribbean

5. PROJECT TITLE (maximum 40 characters)
 Forestry Management

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)
 MM DD YY
 11 30 89

7. ESTIMATED DATE OF OBLIGATION
 (Under "B." below, enter 1, 2, 3, or 4)
 A. Initial FY 84 B. Quarter 4 C. Final FY 86

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

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	50		50	2,000		2,000
(Loan)	6,000		6,000	6,000		6,000
Other						
U.S.						
Host Country		1,300	1,300		11,400	11,400
Other Donor(s)						
TOTALS	6,050	1,300	7,350	8,000	11,400	11,400

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) FN	280-B	160	160			50	6,000	2,000	6,000
(2)									
(3)									
(4)									
TOTALS						50	6,000	2,000	6,000

10. SECONDARY TECHNICAL CODES (maximum 8 codes of 3 positions each)
 096 067 968

11. SECONDARY PURPOSE CODE
 120

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	ENV	BR	TECH	LAB	TNG
B. Amount	40%	35%	10%	10%	5%

13. PROJECT PURPOSE (maximum 480 characters)

The project purposes are threefold: (1) promote sound public sector forest management; (2) to promote private sector involvement in forestry production, and in order to accomplish the above, (3) to strengthen the institutional capacity of the Directorate General for Forestry (DGF) to fulfill its mandate for the forestry sector.

14. SCHEDULED EVALUATIONS

Interim	MM	YY	MM	YY	Final	MM	YY
	05	86	11	87		11	89

15. SOURCE/ORIGIN OF GOODS AND SERVICES
 000 941 Local Other (Specify) 899

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

Approval of Methods of Implementation/Financing: *Gerald Hensley*, Act. Cont.

17. APPROVED BY
 Signature: *Philip R. Schwab*
 Title: Philip R. Schwab, Director, USAID/DR
 Date Signed: MM DD YY
 08 13 89

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

- / -

PROJECT AUTHORIZATION

NAME OF THE COUNTRY: Dominican Republic
NAME OF THE PROJECT: Forestry Management
NUMBER OF PROJECT : 517-0173
NUMBER OF LOAN : 517-T-050

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Forestry Management Project for the Dominican Republic involving planned obligations of not to exceed Six Million United States Dollars (\$6,000,000) in loan funds ("Loan") and Two Million United States Dollars (\$2,000,000) in grant funds ("Grant") over a five year period from date of authorization, subject to the availability of funds in accordance with A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.

2. The project ("Project") will assist a program to be implemented by the Directorate General for Forestry (DGF) to develop and strengthen the institutional capacity within the Government of the Dominican Republic (GODR) and assist it in undertaking action programs to promote private sector investment in forestry production.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is 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 Payment (Loan)

The Cooperating Country shall repay the Loan to A.I.D. in U.S. Dollars within twenty-five (25) 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 (i) two percent (2%) per annum during the first ten (10) years; and (ii) 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 and services, except for ocean shipping, financed by A.I.D. under the Loan shall have their source and origin in the Cooperating Country or countries included in A.I.D. Geographic Code 941,

except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the Cooperating Country or of countries included in A.I.D. Geographic Code 941.

c. Source and Origin of Goods and Services (Grant)

Goods and services, except for ocean shipping, financed by A.I.D. under the Grant shall have their source and origin in the United States or in the Cooperating Country, 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 United States.

c. Conditions Precedent

(1) First Disbursement. Prior to the first disbursement of the grant portion of the assistance, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the GODR will, except as A.I.D. may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) An opinion of the legal advisor to the GODR that the agreement has been duly authorized and/or ratified by, and executed on behalf of the GODR and that it constitutes a valid and legally binding obligation of the GODR in accordance with all of its terms;

(b) A statement of the name of the person who will represent the GODR and of any additional representatives specified in section 9.2, and a specimen signature of each person specified in such statement;

(c) Evidence that a Project Coordination Office (PCO) has been established as part of the Programming and Planning Division at DGF;

(d) Evidence that a Project Director and a full time Coordinator have been appointed within the PCO for the project;

(e) A technical assistance plan including the scope of work for the long-term technical assistance to be provided under the particular activity; and

(f) Evidence that counterpart personnel for each long-term advisor have been appointed.

(2) Technical Activities to Improve Forest Management. Prior to disbursement or the issuance by A.I.D. of documentation pursuant to which disbursement will be made to finance the technical activities

funded by loan or grant resources for the Forestry Management Component of the Project, the GODR shall, except as A.I.D. may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D.:

(a) An administration manual which describes the procedures to be followed in accounting for project funds and acquiring goods and services for the operation of the technical units;

(b) Evidence that the Research Unit and an Extension Unit in the Technical Division have been established;

(c) Detailed overall project implementation plans, including evidence that the staff of the Research and Extension Units have been hired, schedules of activities to be undertaken by these units and their equipment requirements; and

(d) An operational budget for all the project activities to be financed by funds provided by the GODR during the first year of implementation, including a schedule indicating when GODR disbursements will be made to the DGF account for this project.

(3) Procurement of Equipment and Vehicles. Prior to disbursement, or the issuance by A.I.D. of documentation pursuant to which disbursement will be made to finance the procurement of equipment and/or vehicles for the Project, the GODR shall, except as A.I.D. may otherwise agree in writing, furnish, in form and substance satisfactory to A.I.D.:

(a) A list of equipment and vehicles required for project implementation, and a schedule for purchasing the equipment;

(b) Technical specifications for specific equipment and vehicles; and

(c) A plan for the assignment, control and maintenance of heavy equipment and vehicles.

(4) Training Activities. Prior to the disbursement or the issuance by A.I.D. of documentation pursuant to which disbursements will be made to finance Training Activities under the project, the GODR shall, except as A.I.D. may agree in writing, furnish in form and substance satisfactory to A.I.D., evidence of:

(a) A detailed training plan outlining the different categories of training, and how and when training will be accomplished;

(b) Detailed criteria for selection of candidates for each category of training; and

(c) Plans for assignment of returning trainees to positions and tasks appropriate to their training.

e. Covenants

The GODR covenants that:

(1) DGF will receive 100% of the proceeds of revenues collected by DGF as a result of the Directorate's enforcement of Law 5856;

(2) The level of tax applied to imported wood products will be revised with a view towards favoring the promotion of national wood production; and

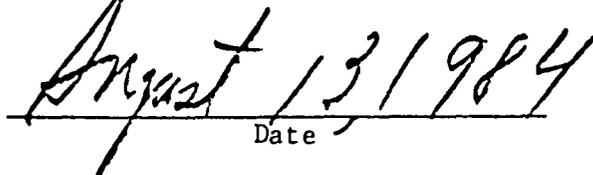
(3) The DGF will be authorized to charge fees for such special technical services, or assignment of personnel to other organizations, public or private, for management planning, reforestation, forest inventories, surveys and demarcation, and the like.

f. Waiver

Motorcycles financed by A.I.D. under the Project and having a total value of approximately \$25,000 may have their source and origin in countries included in A.I.D. Geographic Code 899. Exclusion of procurement from Free World countries other than the Cooperating Country and countries included in Code 941 would seriously impede attainment of U.S. foreign policy objectives and objectives of the foreign assistance program.



Philip R. Schwab, Director



August 13, 1984

Date

PROJECT PAPER - FORESTRY MANAGEMENT
DOMINICAN REPUBLIC

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GUIDE TO ACRONYMS

BAGRICOLA or Banco Agrícola	:	Agriculture Bank of the Dominican Republic
AID	:	Agency for International Development
CATIE	:	Tropical Agronomic Center for Research and Instruction
CEP	:	Country Environmental Profile
CNTF	:	National Technical Forestry Commission
CRIES	:	Comprehensive Resource Inventory and Evaluation System
DGF	:	Directorate General for Forestry
FAO	:	Food and Agriculture Organization of the United States
FOCO	:	Field Operation Coordinating Office
GODR	:	Government of the Dominican Republic
IDB	:	Inter-American Development Bank
IICA	:	Inter-American Institute of Agriculture Sciences
INDRHI	:	National Hydraulic Resources Institute
ISA	:	Instituto Superior de Agricultura
NARMA	:	Natural Resource Management Project
PCO	:	Project Coordinating Office
PIO	:	Project Implementation Order
SCS	:	Soil Conservation Service

SEA : Secretariat of State for Agriculture
STP : Technical Secretariat of the Presidency
SURENA : Sub-Secretariat for Natural Resources
UNDP : United Nations Development Program
USDA : United States Department of Agriculture
USFS : United States Forest Service

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- Virgilo Muñoz	:	DGF
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PROJECT FILES

LIST OF DOCUMENTS

- President Salvador Jorge Blanco Decree No. 1315, dated August 11, 1983.
- "Institutional Analysis of National Directorate of Forests", by Alan C. Randall, May 1984, Seattle, Washington.
- "Economic Analysis of the Forest Management Project", by Hans Gregersen, May 1984.
- "Social Analysis of the Forest Management Project", by Margaret Sarles, May 1984.
- "Financial Analysis of Forest Management Project", by Instituto Superior de Agricultura's Centro de Administración del Desarrollo Rural, May 1984.
- "Technical Aspects of the Forest Resources Management Project", by David A. Harcharik, May 1984.
- "La Celestina Forest Management Plan Outline", by Swedforest Consulting AB.
- "Estimates of Forestry Technicians and Professionals, Projected from 1970 to 1985".

- / -

I. SUMMARY

A. Summary of the Problem

The forestry sector in the Dominican Republic is underdeveloped as a productive resource and poorly managed as a source for soil and water conservation. Large areas of forest have been cut or burned and placed in production as crop or grazing land. Production forestry for fuelwood or timber, either through management of natural forests or plantations, has been stymied by confused and confusing government policies which discouraged investment and sound management. The principal institution charged with implementing GODR policy and protecting Dominican forests is the Dirección General Forestal or Directorate General for Forestry (DGF). DGF has been a weak, neglected stepchild of an institution since its creation in 1962, and has focused its attention on law enforcement rather than forestry development and management.

The results of this have cost the Dominican Republic dearly. Large amounts of foreign exchange are spent on wood products which could be produced domestically. Thousands of jobs have been lost because of government imposed cutting restrictions, "mining" of forests by exploiters of natural forests, and decreased supply of hardwoods for artisans. Fuelwood and charcoal production remains at a primitive level of technology and low level of profitability, while at the same time causing considerable ecological damage. Perhaps most critical of all, the watersheds which feed major hydroelectric and irrigation investments have deteriorated dramatically. The productive life of these investments has been shortened by siltation, costs of maintenance and repair have been greatly increased, and their reliability reduced because of irregular stream flow out of the watersheds.

B. Brief Description of the Project

The proposed \$19.4 million project (Loan \$6 million; Grant \$2 million; GODR \$11.4 million) is designed to stimulate rational development and management of the forest resources of the Dominican Republic. The project will: (1) strengthen the DGF through reorganization, training, provision of equipment and technical assistance for program development, planning and execution; (2) complete pilot field activities in two forestry development zones including reforestation of 3,000 hectares, a forest inventory of 68,000 hectares, and development and implementation of management plans for 68,000 hectares of land under DGF stewardship; and (3) support private sector initiatives in production forestry by assisting the GODR to create an auspicious policy environment, by providing analyses of markets and adaptable technologies, and by establishing a credit fund earmarked for private sector forestry development. The implementing agency will be the DGF.

II. BACKGROUND

A. The Problem

The Dominican Republic, like most Third World countries, has suffered an accelerating rate of deforestation of its natural forests (those not planted by man). Forest covered 69 percent of the Dominican Republic in 1940, but dwindled to 23 percent in 1973 and then 16 percent in 1982. The causes of this denuding are common: expansion of cultivated and grazed land due mostly to population pressure, cutting of trees for firewood and for charcoal production, and exploitation of high value hardwoods for lumber. In areas which still have stands of forest, natural reseeding has not kept pace with cutting, and has been totally prevented in areas where permanent agriculture has replaced slash and burn practices. Because of the topography, climate and natural resource endowments of the Dominican Republic, the loss of forests has been especially serious in three ways: (1) deterioration of watersheds has affected hydroelectric and irrigation development, (2) loss of foreign exchange to import lumber, pulp and other wood products formerly produced domestically, and (3) rapid denuding of some fragile ecological zones, particularly the dry forests being cut for fuelwood. Exacerbating these problems has been the lack of an active forest service, capable of vigorously promoting sound forest management, which has hindered public and private efforts to ameliorate these problems.

1. Watershed Management

Deforestation in the Cordillera Central, where the major river systems of the country begin, presents major problems for the hydroelectric and irrigation systems of the Dominican Republic. Soil erosion, due primarily to deforestation, has reached 100 to 500 tons per hectare per year in some areas. Two major reservoirs have extreme sedimentation problems now. The Tavera reservoir lost 40 percent of its dead storage capacity in the first seven years after its completion. Siltation in irrigation canals and hydroelectric generators necessitates greater maintenance costs, causes more time lost for repair and cleaning, and poor on-farm water use.

In addition to erosion and subsequent siltation, deforestation exacerbates water flow resulting from seasonal and diurnal variation in rainfall. Thus, stream flow during the marked dry season, November to May, has tended to decrease. At the same time, wet season flooding has increased, causing damage to crops, property and wildlife.

2. Decline of the Timber Industry

A combination of factors has led to a decline of industries related to timber production. In 1967 a ban on tree cutting, closure of sawmills, and control of the flow of forest products were imposed. This severe action resulted from a surge in deforestation during the

post-Trujillo period. Nearly 200 sawmills were closed and an estimated 3,000 people in the Cordillera Central lost employment related to timber cutting. Untold others who used lumber as a raw material were also displaced. Another result of the ban was the acceleration of uncontrolled, illegal deforestation, often done by fire, to establish pasture and crop land.

Even prior to the ban, there was serious depletion taking place of valuable Dominican hardwoods, particularly oak and mahogany. In many areas the virtual disappearance of these species eliminated many jobs among artisans and furniture makers.

Perhaps the most deleterious effect of the demise of the Dominican timber industry is the drain of foreign exchange to import wood and wood products for construction, pulp and paper. Despite tight import restrictions, the reported value of imports has risen steadily during the past decade to nearly RD\$30 million annually. The overwhelming majority of these imports could be produced in the Dominican Republic, if present stands were properly managed and if significant areas suitable solely for forestry were put into timber production.

3. Fuelwood and Charcoal Production

Wood and charcoal are traditional sources of fuel for Dominicans, especially the poor and rural population. This situation is unlikely to change. As demand has remained high and prices have increased, fuelwood cutters and charcoal makers have moved into new areas, as well as intensified their cutting in traditional areas, thus accelerating the rate of deforestation. Dry scrub forest areas are especially vulnerable when charcoal making is combined with goat grazing on cut areas.

The methods used to collect wood and convert it for fuel are known to be inefficient, in engineering terms, in addition to being environmentally destructive. The AID-funded Energy Conservation and Resource Development project is adapting and developing technologies for use in the Dominican Republic which use fast-growing species and efficient conversion methods. However, field applications of these technologies which are financially sound must be developed and then disseminated, with special attention to the present producers.

4. Directorate General for Forestry and Forest Management

From its creation in 1962 until approximately 1980, DGF was essentially a neglected institution, existing as an appendage of first the Secretaría de Estado de Agricultura (SEA) and then the Fuerzas Armadas (FA). DGF's mandate, as established in 1962 legislation calls for a full range of service, management and enforcement functions; but practically, its operational objectives were limited to control of

forested State lands, enforcement of the 1967 cutting ban, and some reforestation. Consequently, DGF now has only one certified forester among its 2,000 employees, the majority being forest guards. DGF had neither the budget nor the personnel necessary to expand its functions and has been dependent upon sporadic donor assistance in critical areas. For example, DGF presently lacks much needed applied research, extension and planning divisions, as well as management and fire protection capacity for State controlled lands. Since late 1980, the organization has begun to receive increasing political attention and support from the Office of the Presidency to bring about the reorientation and strengthening of DGF, which is necessary to activate the forestry sector.

B. Response to the Problem

1. Assistance from Other Donors

Several donors have supported GODR efforts in the forestry sector over the past 20 years (see Figure 1). Some baseline data has been collected to support DGF in planning, management and reforestation. A training center for forestry technicians and guards was established in Jarabacoa and is again operating. Several detailed plans were developed for management of forested areas and for reorganization and strengthening of DGF. Pilot reforestation efforts, both for watershed management and plantation forestry production, were implemented. Unfortunately, much of the data collected has been only partially analyzed and most of the planned interventions to fortify DGF were only partially implemented.

2. AID Support for GODR Forestry Related Efforts

AID support in the forestry sector began in the mid-1960's with a sector investigation by Brown and Root, Inc. Following this, no other activities specifically directed at forestry were carried out until the present. However, several projects have been instrumental in spurring interest in forestry as it relates to energy and natural resource management.

In 1977 the Comprehensive Resource Inventory and Evaluation System (CRIES) project used LANDSAT imagery to produce resource maps and in 1980 compiled extensive data on vegetative cover. CRIES data have been widely used as a basis for land use planning.

Building on the CRIES project, a Country Environmental Profile (CEP) was completed in October 1980. This comprehensive analysis of the Dominican environment and environmental problems presents specific sections directed at institutional aspects, water resources and watershed management, and plantation forestry, among others. Since its publication, the CEP has become the guide for many Dominican policy decisions regarding the environment, generating sufficient support in the GODR to implement many of the proposed changes.

FIGURE 1

OTHER DONOR ACTIVITIES IN FORESTRY

Donor Agency	Years	Type of Assistance	Results
Organization of American States (OAS).	1967	Technical assistance. Reconnaissance survey of physical resource base.	<ol style="list-style-type: none"> 1. Ecological, land use and soil maps. 2. Inventory and description of forests, special detail of pine forests. 3. Recommendations for reorganization and upgrading of technicians in DGF. 4. Forest resource development program including: (a) national forest inventory; (b) pilot reforestation of 10,000 ha.; (c) establishment of Administrative and Accounting offices; and (d) revision of Forestry Law 5856. Upgrading of technicians did not occur and pilot reforestation effort was reduced to 2,000 ha.
Food and Agriculture Organization (FAO).	1968-1973	Technical assistance. Completion of national forest inventory recommended by OAS, strengthening of DGF, development of model management plan.	<ol style="list-style-type: none"> 1. Revision of Law 5856 drafted. 2. Six-year plan for reorganizing DGF developed. 3. Establishment of a training center in Jarabacoa for forest technicians and guards. 4. Forest inventory with thematic maps. 5. Model management plan prepared for 13,000 ha. area. The law was never submitted to Congress. Six-year plan for DGF was not implemented. The Jarabacoa training center was established and has trained 50 technicians and 150 guards. Inventory established most complete and useful data base on Dominican forests. Management model was scaled down to 2,000 ha. reforestation activity.
Interamerican Development Bank (IDB).	1975-1982	Technical assistance. Protection of the Tavera reservoir watershed (Rio Yaque del Norte).	<ol style="list-style-type: none"> 1. Management plan for Rio Yaque del Norte completed. 2. Plantation forest of 936 ha. established in watershed. 3. Numerous soil and water conservation activities, such as mini-dams, terraces and demonstration plots. All activities were completed and have been continued through direct GODR support since 1982.
Swedish Forest Service.	1979-present	Technical assistance. Evaluation and planning of forestry project in Plan Sierra area.	<ol style="list-style-type: none"> 1. Forest survey completed for 30,000 ha. area. 2. Management plan developed for initial area, 3,860 ha. of principally pine forest. This is the first forest management plan to be reviewed and approved by DGF. The plan calls for commercial forestry exploitation and reforestation by a private corporation on State-controlled land.

USAID/DR presently has a major project, the Natural Resource Management project (NARMA), which implements some of the CEP recommendations. Included in NARMA is funding for the development of action plans related to forestry, among them the National Forestry Management Strategy presented to President Jorge Blanco in August 1983. The Management Strategy provides the terms of reference and technical/scientific criteria for planning, development, management and conservation of Dominican forest resources based upon sustained yield and multiple use principles. Further technical assistance has been directed toward policy analysis and legislation to develop DGF (see 3.b. below). Small agroforestry schemes are being used in soil conservation efforts in two watersheds of the country.

Finally, the USAID's Energy Conservation and Resource Development project, through the Wood Fuel Development component, will carry out a series of engineering studies on various technologies for fuelwood production, processing and conversion. These studies include species trials, drying and storage techniques, large- and small-scale charcoal conversion technologies, and nursery operation, with applications to conditions in the Dominican Republic. The project will provide valuable technical information for reforestation, "energy farm", and agroforestry strategies in the Dominican Republic.

3. Recent and Current GODR Initiatives

Significant attitudinal change has taken place among Dominican policy makers in the recent past regarding natural resource management, forestry and watershed management in particular. This change has two radically different but closely related sources, a series of technical analyses, such as the CEP, and a series of natural calamities, most notably two severe hurricanes and a major forest fire. This counterpoint has called the attention of the Jorge Blanco administration and much of the public to the need for a comprehensive policy and concerted effort in forestry and watershed management. 1983 was declared the Year of Reforestation in the Dominican Republic. During this year the Jorge Blanco administration followed up the initiatives of the Guzmán government to formulate and implement national policy for the forestry sector.

a. DGF

In order to begin the process of upgrading the technical capability of DGF, the GODR funded in 1980 the off-shore training of 35 foresters, 10 at the Bachelor's level and 25 as three-year (dasónomo) technicians. An additional forester is presently pursuing a Master's degree under NARMA funding. The return of these trained personnel, beginning in mid-1984, will give DGF its first cadre of professional foresters. Also during 1980, the Escuela Nacional Forestal "Dennis Stammers Smith" in Jarabacoa was reopened. This school provides

training for forest guards and, on a limited basis, for forest technicians at the two-year (perito) level.

In the past five years, the GODR has more than doubled the budget of DGF. More importantly, each year a greater proportion of the budget has been allocated for operations, particularly reforestation. The annual hectareage reforested has nearly tripled during this period, but is still far less than necessary. As more nurseries are established and the forest technicians trained, significant increases in reforestation will become practical.

In an effort to make DGF more effective prior to its reorganization, the GODR placed the agency directly under the Office of the Presidency. This gives DGF its own budget and allocations independent of the SEA. With the creation of the Comisión Nacional Técnica Forestal (CNTF) in 1982, DGF is provided direct oversight and guidance as it becomes a truly sector-wide forest service.

b. Legal Environment

The legal environment in the Dominican Republic as related to forestry is in a transition stage, characterized by temporary legislation and executive orders. Law 5856, passed in 1962, is still the basic forestry law of the country. DGF was established under this legislation, and its functions, responsibilities and institutional structure were defined.

In 1967, DGF was administratively moved from SEA and made a branch of the Dominican Armed Forces by Law 206. DGF's mandate and structure remained unchanged. An executive order issued at the same time effectively closed all sawmills and instituted controls on the processing and movement of forest products. This order is commonly referred to as the cutting ban. The cutting ban was reinforced in 1969 by decree and again in 1982 by legislation.

The 1982 legislation, Law 705, made two significant changes in the regulatory statutes for forestry. First, the CNTF was established to develop policy, compile data, and provide guidance for the Congress and the Executive relating to the forestry sector. Further, the CNTF was also given the responsibility to review proposals for forest exploitation on State lands and in natural forests. The CNTF is composed of representatives of SEA, DGF, the Instituto Dominicano de Recursos Hidráulicos (INDRHI) and Parques Nacionales. Thus, pending the establishment within DGF of a planning and management unit with the technical expertise to review forest management plans, the CNTF will review these plans.

Law 705 also gave the cutting ban the force of law. Furthermore, it prohibited the acceptance or approval of forest management plans from either public or private entities pending passage

of the National Forestry Management Strategy, which will be introduced in the Dominican Congress during the 1984 session. Little opposition to the strategy is anticipated because of the high level of public interest and strong Presidential support.

Recently President Jorge Blanco sent to Congress a Forestry Incentives Law which strengthens Law 705 by providing tax holidays and reductions to private forestry investors. The Incentives Law also establishes mechanisms for foreign investors, international donor assistance forestry projects, and a forestry loan portfolio at Banco Agrícola. As in the case of the Strategy, Congressional support is expected to be strong.

c. CNTF Working Groups

In August of 1983, President Jorge Blanco appointed an Executive Secretary to CNTF to coordinate and expedite the efforts of four working groups dealing with GODR forestry policy. The first group is formulating zoning policy based on ecological conditions and determining which areas are suitable for protection forestry, commercial forestry, fruit production, coffee plantations, etc. This group works closely with the Subsecretaría de Estado de Recursos Naturales (SURENA), which has received considerable technical assistance from Michigan State University under the NARMA project. Another working group is examining the potential of forest areas to produce employment for people presently living in these areas. The group will also be developing GODR policy for employment promotion and possible relocation of populations presently in declared forest zones.

The third working group has been tasked with preparing a final plan to strengthen DGF through reorganization, technical capacity development, and equipment procurement. Thus far the group has elaborated an organigram for DGF's new structure. Under this reorganization, new units are to be created in the following areas: administration, a special project unit to coordinate efforts such as reforestation, an office of programming to assemble information and development plans and budgets, and a technical department with divisions for research, extension, fire protection, forest area management and engineering. An assessment of technical skills is being done, as well as a preliminary staffing pattern for the reorganized DGF.

A fourth working group will develop legislation in three areas relative to forestry: (1) incentives for private sector investors; (2) land use and land tenure legislation; and (3) amendments to present legislation to implement the reorganization of DGF. Legislation for private sector investors delineates requirements for receipt of forestry production certificates, one of which will be an approved management plan reviewed by DGF. The certificates guarantee investors the right to cut and mill or otherwise process the products detailed in the management plan. Additional legislation will give DGF

the authority to regulate and enforce forestry zones as detailed by the first working group.

C. Constraints to Problem Solution

1. Institutional Capacity of DGF

a. Personnel

Although the GODR has taken a significant first step toward enhancing DGF's capabilities by training 10 foresters at the B.S. level and 25 forestry technicians abroad, the present and projected deficiencies remain large. According to the Oficina Nacional de Administración y Personal (ONAP) the DGF needs a total of 74 forestry technicians, 21 B.S. level foresters/administrators, and 5 M.S. level specialists. Without the technical expertise represented by these trained personnel, DGF will find it difficult to meet its research, planning, management, and fire protection responsibilities.

b. Equipment

DGF's equipment needs are significant and diverse. Fire protection equipment needs include very basic tools, protective equipment for fire fighters, and vehicles. DGF must outfit two regional research stations. Basic office equipment is limited and DGF presently lacks a meeting room, a library and adequate office space.

c. Reorganization

The reorganization of DGF must be completed as outlined in the organigram in the Institutional Analysis (IV.A). This proposal is based on a model developed by FAO in 1967 and modified by CNTF. The present arrangement, under which DGF has been brought under the administration of the Office of the Presidency, can only be regarded as a temporary measure, not a permanent solution to problems such as budgeting, because of the highly discretionary nature of Office of the Presidency funds.

2. Lack of Private Sector Involvement

a. Legislation

The 1967 cutting ban will be effectively eliminated with passage of the National Forestry Management Strategy, which is presently in committee in the Dominican Congress along with the Forestry Incentive Law detailing the responsibilities and rights of investors in forestry. Legislation clarifying tenure rights on forest lands under the variety of tenure systems operating in the Dominican Republic will be needed in the future for more rational management of forest lands. No governmental restrictions have ever existed on private plantation

(seeded) forests in the Dominican Republic, but very little area has ever been planted because of uncertainty among investors regarding possible future intervention by DGF. Each of these legal actions will provide an improved environment for planned exploitation and conservation of forest resources. They are not, however, essential as prior conditions to the initiation of the Forestry Management Project. Where authorities are unclear and legislative action is pending, special dispensations can be gained through the executive branch to permit pilot activities to be carried out. As examples, the Secretariat of Agriculture has received authority to conduct logging operations in the Plan Sierra area, and the CNTF has approved forest management plans.

b. Knowledge of Investment Possibilities

Because of the low level of activity, both public and private, in production forestry over the past 20 years, little knowledge of investment options exists in the Dominican Republic, be it in timber, fuelwood or pulp production. Relevant financial data are generally dated incomplete, or based on production in other countries. Wood product markets are presently geared to importation, not domestic production. Furthermore, there exists no real mechanism for the dissemination of information of forestry production economics and marketing, nor is there sufficient credit, either through public or private institutions, to support investments in forestry.

c. Preparation of Forest Management Plans

Present Dominican law requires approval by DGF of a management plan prior to exploitation of forest resources in natural forests. Few trained foresters exist in the Dominican Republic to prepare such plans, or to review them at DGF. Thus far only one forest management plan has been approved, for Plan Sierra's La Celestina area. Plan Sierra is a large GODR integrated rural development project on the north slopes of the Cordillera Central. The plan for mangement of the 3,800 hectares in La Celestina was prepared by Swedish technicians under a donor funded project. Costs of preparation and approval of these plans may prohibit small landholders from participating and may thus encourage illegal or inappropriate use of forest resources.

III. PROJECT DESCRIPTION

A. Project Goals

The goals of the Forestry Management project are: (1) to increase the long-term employment and income potential of the rural population of the Dominican Republic, especially the rural poor, (2) to generate import substitution of wood (and petroleum) products and savings of foreign exchange, and (3) to improve natural resources and energy conservation practices in the Dominican Republic. Over the longer range,

the project is expected to contribute as well to increased agricultural outputs.

B. Project Purposes

The Forestry Management project purposes are three: (1) promote sound public sector forest management; (2) to promote private sector investment in production forestry, and to accomplish the above, (3) to strengthen the institutional capacity of the Dirección General Forestal (DGF) to fulfill its mandate for the forestry sector.

The project purposes are closely interrelated as discussed below and contribute directly or indirectly to the project goals.

C. Project Concept and Strategy

1. Modifications in Concept

At the project identification stage, this project was conceived as a broader-scale effort to tackle the full range of forestry problems of the Dominican Republic. During the succeeding months, and resulting from continuing discussions with the GODR, internal AID reviews, and the work of the project design team, the concept and strategy of the project have been scaled down and refined. The project continues to build the basis for three beneficial outcomes:

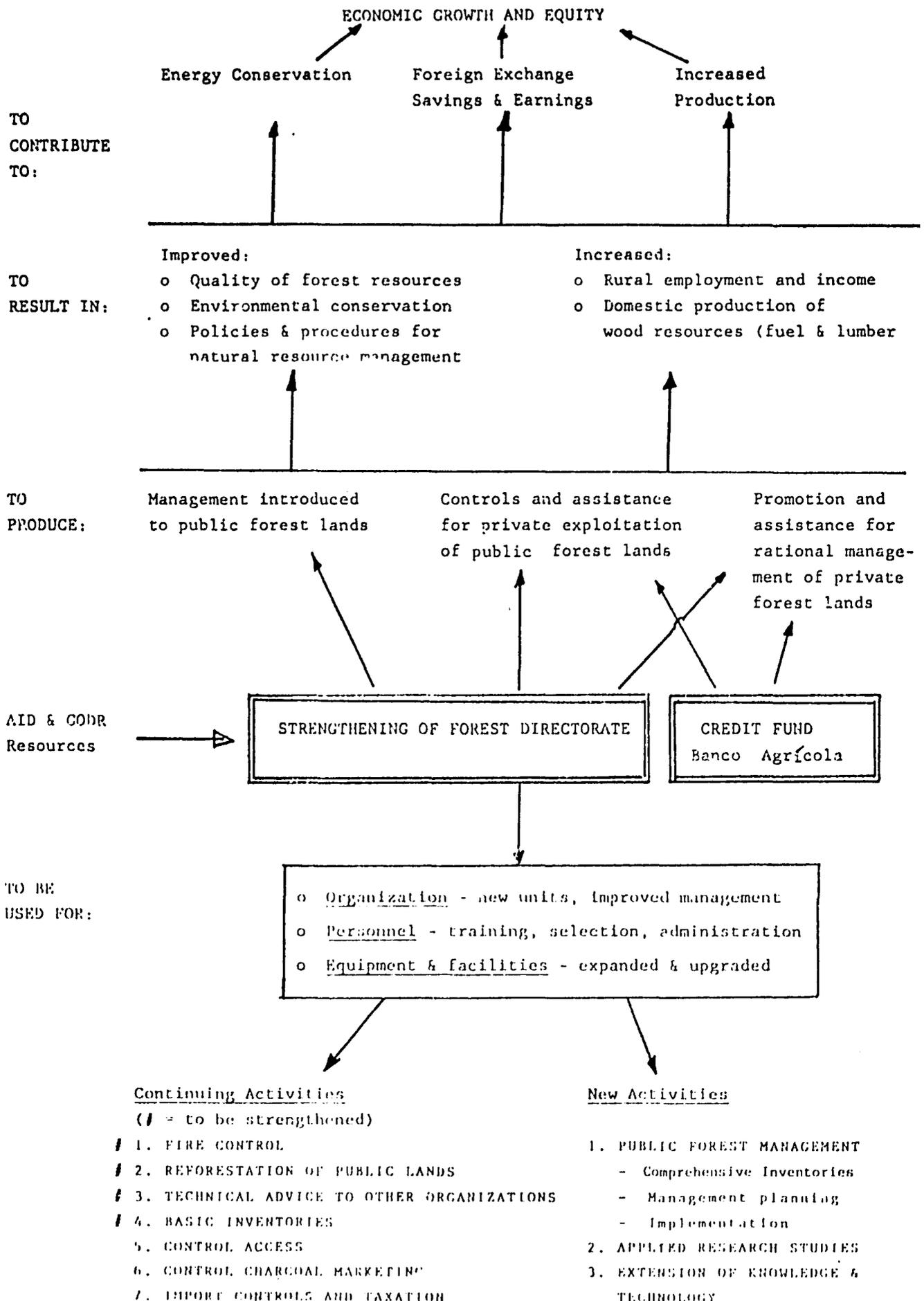
- a. employment generation;
- b. environmental management and protection; and
- c. foreign exchange savings, and later, earnings.

In order to achieve these ends within the Dominican context described above, the project will be geographically concentrated; studies, plans, and activities will be functionally limited and oriented toward early wood production; extension and credit activities will be oriented toward private sector involvement; and one principal institution, the DGF, will receive significant technical and resource inputs to realize its broad mandate in the forestry sector. The credit component will be initiated through the national agricultural bank, Banco Agrícola.

The current concept of the Forest Management Project is depicted in Figure 2 on the next page. This means-ends chart should be read from the middle. Going up from the middle, where AID's intervention occurs, are the outputs, purposes, and broader goals that the resources are expected to promote. Going down from the middle, the reader finds the ways in which AID resources will be applied, commonly called inputs and activities.

FIGURE 2
FORESTRY MANAGEMENT PROJECT CONCEPT

10(ii)



Continuing Activities

(/ = to be strengthened)

- / 1. FIRE CONTROL
- / 2. REFORESTATION OF PUBLIC LANDS
- / 3. TECHNICAL ADVICE TO OTHER ORGANIZATIONS
- / 4. BASIC INVENTORIES
5. CONTROL ACCESS
6. CONTROL CHARCOAL MARKETING
7. IMPORT CONTROLS AND TAXATION

New Activities

1. PUBLIC FOREST MANAGEMENT
 - Comprehensive Inventories
 - Management planning
 - Implementation
2. APPLIED RESEARCH STUDIES
3. EXTENSION OF KNOWLEDGE & TECHNOLOGY

2. Strategic Choices Made

In order to carry out the concept, the Mission and the GODR have reached certain decisions and agreements about focus and emphasis and institutional roles. These are summarized below.

a. Geographic Concentration

The project will focus on two areas of public forest land, and the adjacent private woodlands. A national scope would clearly be beyond the current capacities of DGF, given its present (but improving) staff composition, the variety of ecological zones in the country, and the newness of many of the technologies that are needed. The project will use two selected areas as training/learning grounds for forest inventory, land management planning and implementation, applied research, and improved fire control. The areas are chosen by the application of technical criteria, as well as for their manageability by DGF, and the high probability of their producing wood products and applicable lessons in the near term.

b. Functional Focus

The project will focus on public land management, extension of technology to private landowners and contractors, introduction of a carefully defined range of applied research, and further improvement of DGF's most effective operation, fire control, that is especially important in the country's pine forests. These activities and resources will be introduced in phases as DGF capacity develops. As the DGF demonstrates growing ability, additional functions such as agroforestry development, social or community forestry, tropical forest management, and range management, might be added, perhaps in a follow-on program. This project tries to give priority to those functions that are most immediately needed, manageable by the DGF, and likely to render early results in terms of the broader goals.

c. Private Sector Involvement

As noted earlier, private sector participation in forestry has been officially blocked for several years. While small-scale farmers and other rural people "mine" the forest informally for wood and fuel, there has been no legal framework, technical knowledge base, economic information, or incentives to permit rational private intervention in the forest resources of the country. This project will begin to establish the basis for this, particularly in the areas adjacent to the selected public lands. With time and experience, this can then be broadened to other areas.

At the same time, we know that there is considerable pent-up private interest and demand for participation in the forestry sector. However, in order for it not to be destructive through careless

exploitation, some direction must be given and technology developed within the Dominican circumstances. This can be passed along to the private sector as the standard for responsible woodland management and multiple use, in the same way that the U.S. Forest Service and Bureau of Land Management have set standards, controls, and provided information to private operators in the U.S.

d. DGF as Key Actor

Project analysis assessed the various possible organizational options for implementing this project. Public agencies that were considered included (1) the Secretariat of Agriculture's subsecretariat for natural resources (SURENA), that is already heavily committed to implementing the AID supported soil conservation and lower watershed management project (NARMA); (2) the Instituto Superior de Agricultura (ISA), that is already heavily involved in the central mountains with the Plan Sierra, and is essentially a training and research organization; (3) the National Technical Forestry Commission, that is an advisory body, rather than an action agency; and (4) the DGF.

The DGF was chosen because of the broad national legal mandate with which it is endowed; the limited, but growing capacity in technical forestry that it has or is developing; and the fact that it is already being drawn upon as the principal technical resource by the above agencies as well as other private and public organizations that are mounting nascent forestry activities.

Alternatives to public agencies were also surveyed. Given the history, there are few if any private or community organizations that presently have the technical skill and interest in managed land use that is required to undertake this program, and to begin to meet the country's needs. By international standards, DGF has much room for improvement; in the Dominican context, it emerges as the primary actor in this much-needed program.

This does not rule out considerable interaction among the public agencies, and between the public and private sectors. Indeed, for this project to succeed, there will have to be broad consensus on plans and activities in applied research, fire control, reforestation, and a host of other areas. The project proposes to enable DGF to play a major role in meeting these needs.

e. Credit Component

We expect that the credit component, at the level of funding proposed, will serve only to prime the pump that draws on the well of pent-up demand in the private sector. We have chosen the Banco Agrícola as the initial channel for this program for the following reasons:

(1) The bank now has a proven track record in making loans for natural resource investments under the NARMA program;

(2) The bank is oriented toward the small-scale landowner, and does not have the same rigid collateral requirements demanded by private banks;

(3) The bank has offices located near the proposed forest areas to be developed, that private banks do not have;

(4) The bank is an agricultural sector lender, which few private banks in this country are.

We are confident that as this program begins to show results, and the nature and variety of returns from such lending become known near the end of the project, private sector banks will reassess the risks involved, and begin to meet the demand for investment and working capital credit.

D. Major Project Components

The project has three major components: (1) technical activities related to the management of public forest lands; (2) extension, marketing assistance and credit to promote rational exploitation of public and private forests by the private sector; and (3) strengthening of the DGF related to the above activities.

1. Technical Activities to Improve Public Forest Management (Loan \$2,516,000; Grant \$504,000)

Public forest management in the Dominican Republic is in a very poor state. This results primarily from the lack of experience and tradition of management of this valuable resource. Compounding this is a lack of definition of the boundaries of public forest lands, and of the objectives of their management. The consequences of this are well known: watershed deterioration which causes soil erosion and damage to water management infrastructure; losses to the country of valuable wood and wood products; and losses of revenue to CODR from the sale of timber and grazing rights.

The Forestry Management project will provide DGF the opportunity to gain field experience with guidance and support through technical assistance as two major forest areas are to be brought under planned management. DGF personnel and expatriate technical assistance will complete management plans, boundary demarcation, establishment of field offices, development of management plans, and initial implementation of the plans. The forested areas, Sierra de Bahoruco and Sabana de San Juan, have been selected based on a number of criteria, including the potential volumes of marketable timber, the scale of the forests, the well-defined public status of the land, road access, the

species composition and capacity for multiple uses, and the variety of forest practices likely to be needed, which offer demonstration and learning possibilities for DGF.

These two areas will also serve as regional foci for initial DGF research and extension efforts under the institutional strengthening activities and for private sector development activities. The publicly managed lands and nearby privately managed lands will form forestry development zones. These zones will act as pilots for DGF to develop operational procedures, train technical staff, develop and test extension practices, and establish practices for working with the private sector.

a. Comprehensive Inventory for Site Selection

Comprehensive inventories focusing on forest resource development have not been done since the FAO and GODR completed seven such analyses in 1972. The principle element of these studies is an inventory of the forest, including area, location, volume, species, stand density, forest types and distribution, and accessibility. Prior to the development of management plans for the Forest Management project, these 1972 FAO-GODR inventories must be updated for the two areas selected, Sierra de Bahoruco and Sabana de San Juan.

With funding from the AID-supported NARMA project, these inventories will be updated before activities begin under this project. A contract team using the Comprehensive Resource Inventory and Evaluation System (CRIES), developed under the AID/W CRIES project and applied in the Dominican Republic in 1977, will update these inventories, as well as complete analyses of any endangered species and wildlife in the Sierra de Bahoruco and Sabana de San Juan areas. The team from Michigan State and Ohio State Universities will work closely with DGF staff in this pre-project activity.

Based on this work, one of the two areas will be chosen as the first site for management planning and other technical activities. Work in the second area will be started once the plans for the first have been completed and implementation begun.

A third area will be selected during the project for similar analysis. The technical assistance team will train inventory teams, help design a data base for the area, and assist in analysis of preliminary data, but this will be primarily a DGF effort to carry out.

b. Management Plan Development

Once the choice of first site has been made, a management plan will be developed for the areas following the guidelines in the National Forestry Management Strategy. This process will serve two very important functions. First will be the establishment of a

documented methodology for the national use of a forest area in the Dominican Republic for multiple use and sustained yield. Second, DGF staff will gain invaluable experience in the field by collaborating in the development of the plan, which will contribute greatly to the capability of the institution. Preparation of the second area management plan will give these staff members an opportunity to again apply their experience and teach other staff, while they have technical assistance personnel available for support.

Under each management plan, extensive technical, financial and social analysis will contribute to the final implementation plan including: (1) 1:20,000 forest maps of blocks for exploitation, (2) growth and yield data, (3) soil analysis, (4) slope gradient analysis, (5) fire protection and control scheme, (6) infrastructure plan, (7) land tenure/usufruct plan, (8) legal regulations and rights of way, and (9) implementation plan. A zoning plan will also be prepared which evaluates subareas and assigns priorities for development. The social analysis will include a survey of local organizations and groups, levels of knowledge and interest in forestry among local farmers, labor pool composition and levels and sources of income of the population. A social profile of each zone will be developed, with present forestry practices described, which will guide plan implementation and future extension efforts.

Project funds will provide vehicles, office equipment and supplies, a microcomputer inventory control system, short-term technical assistance, and the preparation of manuals for review, revision, and approval of forest management plans.

c. Public Forest Land Demarcation

The importance of this activity cannot be overstressed, because it is fundamental for high quality management of public forest lands in the Dominican Republic. Without well defined, publicly marked and recognized boundaries, public forest lands cannot be adequately patrolled and monitored. At present, the boundaries of public lands, whether for forests, parks or other uses, are often vaguely defined on maps and contested by squatters.

In coordination with the National Cadaster's Mensuration Division, DGF will quickly move to outline on 1:50,000 aerial photographs the boundaries of the two selected field areas. Then DGF will post notices along the designated boundaries and in local population centers indicating that anyone with a conflicting claim to the land will have 90 days to submit their claim in writing to DGF. Sessions will then be held by the Land Tribunal in Duvergé and Peralta where claimants will present their cases for adjudication. People who have legitimate claims will be offered such alternatives as: (1) a fair price sale; (2) a land trade for similar land outside the project area; or (3) a work arrangement in exchange for permission to remain in the project area. As

soon as claims are settled, the Cadastral Mensuration Division will make the final boundaries with concrete posts and DGF will fence and patrol the boundaries.

Project funds will be used for short-term technical assistance, fencing and boundary marking materials, office supplies, and vehicles.

d. Management Plan Implementation

DGF's institutional experience with management of field activities is limited to small reforestation efforts over the past ten years. The actual implementation of the management plans for Sierra de Bahoruco and Sabana de San Juan will serve to significantly strengthen DGF's capabilities, as well as advance the practice of forest management in the Dominican Republic. As the management plans are long-term plans directed at sustained yields, implementation of the plans must begin under this five-year project. DGF will have sufficient field experience by the end of the project to continue with implementation.

DGF's principal role in the implementation of the management plan will be that of manager and monitor, not implementer. With the exception of reforestation, road rehabilitation, and fire control, DGF will let competitive contracts to the private sector for such tasks as: thinning of dense stands, culling and salvaging of damaged and diseased trees, charcoal production, harvesting of mature trees and construction of fire towers, water storage facilities, and ranger stations.

Over time, these private sector contracts should generate significant income for DGF and alleviate budgetary constraints; this is especially true of the grazing and timber harvest contracts.

e. Fire Control

In the past, DGF has been fairly effective in the control of forest fires, given the resources available for this purpose. However, the level of available resources and logistical support, coupled with an ad hoc mode of response and a lack of trained personnel, do not permit DGF to adequately control fires and protect forests. This task will take on added importance in the future as the value of Dominicans public forests increases with better management.

DGF's fire control and forest protection capabilities will be enhanced in several ways under the project. Through short-term technical assistance, DGF will develop fire control and prevention plans for the two forestry development zones and train DGF crews and local residents in fire fighting and forest protection techniques. These exercises will serve as pilots for later planning and training in other forested areas.

Essential equipment will be provided, including: vehicles, hand tools, water storage and supply equipment, lookout towers, and radio equipment. Additionally, manuals will be developed and fire prevention campaigns carried out to reach the large group of rural people who live near forested areas and who will not receive training by DGF. Fire detection capacity will be upgraded by coordinating with the extension unit and local residents.

f. Forest Research

Applied research related to forest management and production has not been practiced in the Dominican Republic by Dominican institutions. With the exception of species trials for bio-mass production under the AID/Instituto Superior de Agricultura wood fuel development component of the Energy Conservation and Resource Development project, little solid information based upon sound research is being produced in-country. For the long-term development of the forestry sector, applied research must begin quickly and proceed according to a considered plan.

DGF will establish two small field stations for applied research, as part of the field offices in Duvergé in the Barahona district and in Peralta in the San Juan district. These two areas will be the foci of DGF forestry development zone activities. Each station will be staffed by DGF technicians and B.S. level Peace Corps Volunteer foresters; the research will be directed by an M.S. level Dominican forester under a long-term technical assistance contract. The long-term advisor and his DGF counterpart will also establish a core unit at DGF central offices to direct future applied research, coordinate with other institutions included in forestry research, and disseminate the findings of ongoing research through extension efforts. A five-year applied research plan will be developed and begun in the third year of the project.

To establish the field stations and the central office unit, the project will fund purchases of laboratory equipment, vehicles, materials and supplies, and two years of long-term technical assistance. Construction of the stations will be funded by counterpart contributions in conjunction with management field activities.

g. Sub-District Office Support

Presently the district offices which cover the two field areas are each two hours drive from the project sites; the Sierra de Bahoruco area is covered by the Barahona office and San José de Ocoa is the district office nearest to Sabana de San Juan. Therefore, new sub-district offices will be opened in Duvergé (Sierra de Bahoruco) and Peralta (Sabana de San Juan) with space sufficient for approximately ten professionals, including those involved in research and extension.

Each Field Operation Coordinating Office (FOCO) will:

- (1) supervise and support project field activities,
- (2) have accounting and disbursement responsibilities and authority for the field activities,
- (3) process requests for technical assistance and credit from the private sector,
- (4) monitor private sector forestry activities in conjunction with Banco Agrícola,
- (5) monitor forestry research activities within the area,
- (6) supervise extension efforts of vigilantes and peritos in nearby communities,
- (7) carry out liaison functions with district and central DGF offices, especially the PCO,
- (8) support and coordinate with technical assistance personnel, and
- (9) submit detailed quarterly reports to the PCO.

Project funds will purchase radio equipment, office furniture and equipment, office supplies, and vehicles.

2. Promotion of Private Sector Forestry Development (Loan \$557,000; Grant \$324,000)

Private production forestry in Dominican Republic has not been practiced for the past 20 years and is, therefore, an area of business with great uncertainty. Part of this uncertainty stems from past GODR policy, which is now in its final stages of revision and implementation through new legislation.

Despite an improved legislative climate that is favorable to investments in forestry enterprises, there remains a considerable need for information among investors and financiers regarding markets for wood products in the D.R., requirements to comply with the legislation, and the potential returns to the investors and the nation of investments in forestry. The economic and financial analyses conducted for this project indicate high potential returns to the nation and investors in forestry. The second major component of the Forestry Management Project, then, is to promote the development of private sector forestry through extension, market analysis and development, and a credit fund earmarked for forestry.

a. Extension

DGF presently has no extension services and no experience in this area. The development of this service-oriented office, that will produce extension materials, and field testing of extension practices, will be an important component of this project. Extension activities will parallel the other thrusts of the project, thus there will be the establishment of a central office and field office capability in each of the forestry development zones.

Central office activities will be headed by a professional forester and a social scientist with experience in extension. During the initial six months of work, this office will establish relationships with other institutions in Latin America which do

research and extension work in forestry, and with Dominican organizations, both public and private, with interest and experience in forestry. A long-term (two years) technical assistance advisor will begin work in the second year of the project to develop and adapt extension materials, formulate a strategy for national-level and local-level extension, and implement an extension program in the two forestry development zones. In these zones, extension will be directed principally at small producer groups and medium-scale landowners.

As part of the office in each target zone, there will be an extension branch headed by a dasónomo (technician with three years of training), with two peritos (technicians with two years of training) and two Peace Corps volunteers. Their extension activities will include training local residents in fire control and basic silviculture, assistance in preparation of management plans for small-scale producers, initial review of management plans, referrals and technical assistance in areas such as seed selection and pesticide use, and assistance to vigilantes (forest guards) in local organization/social forestry development. Therefore, the extension workers will coordinate very closely with fire protection units, research staff, Banco Agrícola and DGF vigilantes.

b. Market Analysis and Development

With the opening up of the forestry sector, particularly in the renewed cutting of timber, the marketing system for wood products in the Dominican Republic will necessarily change. This system is now geared to importation of timber, with processing taking place near ports or in large cities, where it is sold. Once domestic production is allowed, the quality and type of wood products that are taken from Dominican forest will probably be somewhat different from those presently purchased abroad, possibly requiring consumer product familiarization. Milling will be more effectively done near the logging sites. Dominican forest owners and DGF will need to develop regulations and contracting procedures to protect the interests of both parties, while maintaining sound forest management practices.

To satisfy the need for analysis of wood utilization, future demand, product preferences and the like, the project will fund short-term technical assistance, both expatriate and Dominican. A market reporting system will be developed to monitor and disseminate domestic and regional prices for publication. Short training courses, seminars and public promotional events will be presented to familiarize producers and consumers with Dominican forest products and potential products. Additionally, wood market yards will be established in the forestry development zones as a method of concentrating wood products to facilitate sales. A wood market yard is a controlled collection point near a logging area, where wood is graded, treated, measured, and offered for sale.

c. Credit Fund

To prime the pump for forestry investment in the Dominican Republic, a credit fund of RD \$5 million will be established. This fund will be administered by the Banco Agrícola, and loans will be restricted to the two forestry development zones to facilitate DGF and Banco Agrícola monitoring of this pilot effort.

Credit will be available to private individuals or groups, such as cooperatives or associations, for production forestry ventures on private lands or for contract on public lands within the zone. The application procedure will begin with the preparation of a management plan (in the case of private lands) or an acceptable bid based upon competition for a contract under the public forest management plans. This documentation will be reviewed technically by DGF with a recommendation to Banco Agrícola for favorable action. Banco Agrícola will review the financial analysis of the plan and then make the loan if it is acceptable. Funds will be lent starting in the second year of the project. Annual certification by DGF of compliance with the management plan will be required for continued credit. We anticipate that private banks will begin to make similar loans, as the results of this pilot effort became clear, and expand lending to other areas of the country.

In addition to the RD\$5 million GODR counterpart, possibly funded out of PL-480 local currency generations, the AID funds will provide short-term technical assistance to DGF and the Banco Agrícola, and vehicles for the Banco Agrícola to monitor loans in the forestry development zones.

3. Improving DGF Capacity to Meet Project Goals

The institutional development of DGF will be a major undertaking because of the scope of its responsibilities and the present level of capability within the organization itself. The Forestry Management project will not fully meet this need. Rather, it will establish the basis for future institutional development through the reorganization and strengthening of DGF itself, and the learning that will occur through land management, fire control, training/extension, and research practices in the pilot zones.

DGF capacity will be improved in the areas of (a) organization and management; (b) personnel systems and training, and (c) facilities and equipment.

a. Organization and Management

DGF reorganization and redirection has begun, albeit slowly, from being a forest protection and law enforcement agency to becoming a service and forest management agency. Preliminary assessments of DGF's needs, and the capabilities of its personnel have been

completed. New organizational models have been proposed. Over time, the DGF will establish offices of research, extension, management, technical support and planning/programming. The initial organizational steps will be those directly related to starting the management planning in the first of the two pilot zones, and to establishing the new support units for research and extension. The Project Coordination Office (PCO) and the first field operation coordination office (FOCO) will be set up prior to the disbursement of project funds. The field office will have research and extension units, to be backstopped by the advisors in these activities, and their DGF counterparts, in the head office. The current organization chart, and the changes that occur during the project are discussed in the Institutional Analysis (IV.A).

To lay the groundwork for these organizational changes, USAID will work the DGF prior to disbursement of significant funding on the following:

- organizational plans for the new units (responsibilities, work plans, structure, staff size and composition).
- personnel systems for the new units (position descriptions, promotion ladders, training plans, etc.).

In addition, USAID and the DGF will take steps to assess and strengthen as necessary the skills and procedures of the Administrative Division of the DGF to administer training and personnel, accounting, and other support functions.

Operations manuals will be developed for the new technical units, and as needed for the administrative functions. These will be drafted initially by technical assistance advisors, but will be tested in practice, and critiqued by DGF personnel at top, middle, and field worker levels before becoming official, final guides to operational procedures, forms, data collection and management, and so on.

Senior and mid-level management skills will be developed by (1) on-the-job exposure of the DGF management and staff to the ways problems are approached and solutions found by the U.S. advisors; (2) periodic self-assessment and replanning workshops, projected to be held annually starting six months after the project starts; and (3) occasional short courses of one to two weeks in length for key personnel, to be held in-country using Dominican institutions such as ISA, INFOTEP, or university schools of management. These courses are not further specified here, but might cover, as needed and identified by the DGF and their advisors, such management knowledge and skills as planning, programming and scheduling, leadership and staff development, awareness of concepts of organizational change, data management, and monitoring and evaluation. Training in these skills is now available

through a number of programs, some of them AID-supported. While it may be advisable to have some workshops or short courses specially developed for DGF, we believe that this is not essential, as the skills are generic, and DGF staff can bring their own experiences to the training situations.

Further organizational changes in DGF will be held in reserve during the first two years of project, pending development of broader-scale research, extension, and fire control plans that will have a scope that is broader than just the two pilot areas. As these plans take form, part of the analysis to be done by the DGF staff and their advisors will include the implications of research coordination and improved fire control in pine forest areas for the structure, staffing, and resources of the agency.

Technical assistance in these activities will be provided primarily by the chief advisor to DGF, drawing on the skills and experience of the planning advisor, research and extension specialists, and other members of the project team.

b. Personnel and Training

The DGF's history has not allowed it, until recently, to begin developing a cadre of trained foresters and related technicians. Currently, twenty-two Dominicans (three of them DGF staff) are abroad in Latin America receiving technician and bachelor's level training. They will be added to the DGF staff beginning in mid-1985. Thirteen others have recently returned from Honduras' national forestry school with three-year technical degrees (called dasónomos), and are at DGF or supporting other agencies' forestry work.

A recent study of DGF by the national personnel office, supported by our project analysis, estimated that the DGF would need the following trained personnel in order to meet its mandate and carry out the functions implied in this project:

- 1) 15 B.S. level foresters, trained in other Latin American countries;
- 2) 5 M.S. level specialists, to be trained in the United States;
- 3) 10 dasónomos trained by the National Forestry School of Honduras;
- 4) 60 peritos locally trained; and
- 5) 240 vigilantes locally trained/retrained.

The present training capabilities of the DGF are limited, but provide the basis for improvement.

The National Forestry School at Jarabacoa, which operated sporadically in the past based on the availability of funds, has good physical facilities for both short- and long-term training for vigilantes and technicians. A class of 60 vigilantes was graduated in May of this year and further vigilante training is needed. Technicians (peritos) have not been trained at Jarabacoa since 1982. Both the curricula for vigilantes and technicians must be updated and reoriented.

The project will provide two Peace Corps volunteer foresters as trainers and short-term technical assistance to review and revise the curricula for both the vigilantes and the technicians. In both cases, sections on extension techniques will be included. For the vigilantes, this will focus on social forestry practices, community relations and organization, basic fire control, forest protection, as well as elements of basic forestry. Two hundred forty vigilantes will be trained under the project using the new curriculum.

The technician curriculum will also be altered to reflect recent technical advances in field practices. Additionally, as extension techniques and materials are developed and tested in the field, they will be incorporated into the technician curriculum. By the end of the project, DGF will have the capacity to train its own vigilantes and technicians and to begin a modest extension program nationwide.

Personnel administration within DGF must be improved in order for the agency to recruit, retain, and effectively utilize trained staff. As noted earlier, pre-project conditions will be applied to assure that trainees and additional technical staff are selected and hired based on objective, job-oriented criteria; that they have clear position descriptions and defined roles; and that there are routes for defined promotion and advancement based on performance and training. These standards will be applied to persons funded by USAID or the GODR under this project initially, with the intent that such an approach to human resources will become the norm for the agency as a whole.

c. Facilities and Equipment

The DGF presently is housed near other agencies in Santo Domingo in a building that is barely adequate for present needs, and will require refurbishing and expansion to adequately support this project. Field offices are very basic structures, lacking much of the equipment and vehicles needed to fulfill the mandate of the agency.

Equipment needed, in addition to that mentioned under the technical activities above, includes vehicles for central staff oversight of field programs and for interagency coordination; a microcomputer system to improve data management, planning, and

accounting; a radio system to improve communications among field and headquarters units; and upgrading some of the furniture and equipment of the central offices.

Prior to the procurement of additional vehicles or heavy equipment, the DGF will be assisted in meeting a condition that plans and regulations be developed for vehicle specifications related to intended use, regulations to assure proper use of field and headquarters vehicles, and plans for adequate spare parts and maintenance.

E. Project Outputs and Inputs

The Outputs of the Forestry Management Project are listed below in outline form by project component, roughly in chronological order within components. Outputs listed under Institutional Strengthening do not include field experience gained by DGF staff, since it is not readily quantifiable, but which may be the most important contribution to long-term development of DGF made by this project. Those outputs in the Private Sector Forestry Development section relating to production of forest products are limited to those from the public forest lands within the forestry development zones, and are thus very conservative outputs of this activity.

Project Inputs are summarized in Tables 1 and 2, by project activity and by commodity or line item within components, respectively.

1. Technical Activities - Public Forest Management - Sierra de Bahoruco and Sabana de San Juan
 - a. Inventories for two public forest areas completed including utilization of micro-computer and cartographic equipment.
 - b. Comprehensive inventories and management plans for two public forest areas.
 - c. Boundaries of two public forest areas marked on ground and fenced.
 - d. Land tenure claims within forest areas settled and titles issued.
 - e. Field management offices (sub-district offices) established in Duvergé and Peralta.
 - f. Initial implementation of management plans for two areas.

- g. Fire Control Office upgraded in accordance with institutional development plan and nationwide fire control plan:
 - Personnel trained and equipped with hand tools;
 - Fire control manuals and local plans completed;
 - Water storage and supply equipment in place;
 - Lookout towers constructed and manned;
 - Fire prevention campaign begun.
 - h. Applied research begun in forestry development zones:
 - Research plans developed for each field station;
 - Central office liaison relationships established.
 - i. Nurseries established within forestry development zones.
 - j. Access roads rehabilitated.
 - k. Procedures and operational manuals developed for review and revision of forest management plans and private sector contracts developed.
 - l. Extension field offices established in forest development zones.
 - m. Adaptation and development of extension materials.
 - n. Extension materials field tested in forestry development zones.
 - o. Comprehensive inventory completed for third public forest area.
 - p. Three thousand hectares reforested in Sierra de Bahoruco and Sabana de San Juan.
2. Private Sector Forestry Development
- a. Extension office established within DGF headquarters.
 - b. Liaison with other forest services and universities in Latin America and donor countries established.

- c. Extension strategies developed for national and forest development zone level.
- d. Forest product market analyses completed:
 - Wood products market analysis;
 - Analysis of potential wood products from D.R. forests;
 - Transportation, processing and labor analyses.
- e. Market reporting system established.
- f. Short courses, seminars and other promotional events for producers, buyers and consumers.
- g. One hundred to two hundred fifty loans made for forestry enterprises within the forestry development zones, averaging RD\$20,000 to RD\$50,000.
- h. Timber, fuel and poles/posts valued over RD\$1.3 million produced from within the public forest lands.

3. Institutional Strengthening Outputs

- a. Reorganized DGF with operational units for fire control, research, extension, engineering, and a planning and programming office (which coordinates with international donors).
- b. Operating systems in place for planning and administering project staff, resources, funds, and field operations.
- c. Forestry school curricula and materials for vigilantes and peritos updated and upgraded, including extension, community forestry and new techniques.
- d. Trained staff:
 - Five M.S. level specialists heading technical support units;
 - Fifteen B.S. level foresters coordinating field operations;
 - Ten dasónomos working in extension, research, inventories, etc.;

- Sixty peritos supporting the above, especially in nursery and extension activities.
- e. Communication (radio) system established:
- Nationwide for fire protection and control;
 - Within two forestry development zones for project implementation.
- f. Fleet of vehicles established in accordance with vehicle use plan that will:
- Support fire control and protection nationwide;
 - Support management, research and extension efforts within forest development zone;
 - Support central office to monitor field operations.

TABLE 1
INPUTS BY ACTIVITY

Project Activity	Source of Funds					
	AID			Total		Total
	Loan-FX	Loan-LC	Grant	AID	GODR	
	(\$ 000)					
1. <u>Technical Activities -</u>						
<u>Public Forest Management</u>						
a. Comprehensive Inventory	50	-	-	50	70	120
b. Management Plan Development	135	45	84	264	270	534
c. Public Forest Land Demarcation	70	40	36	146	640	786
d. Subdistrict Office Support	100	82	-	182	174	356
e. Management Plan Implementation	1,063	218	108	1,389	1,756	3,145
f. Fire Control	335	220	36	591	190	781
g. Forestry Research	114	44	240	398	336	734
Subtotal - TA - PFM	1,867	649	504	3,020	3,436	6,456
2. <u>Private Sector Forestry Development</u>						
a. Extension	232	115	240	587	157	744
b. Market Analysis and Development	75	75	60	210	174	384
c. Credit Fund	45	15	24	84	5,015	5,099
Subtotal PSFD	352	205	324	881	5,346	6,227
3. <u>Strengthening of DGF</u>						
a. Organization and Management	-	-	900	900	400	1,300
b. Personnel and Training	870	-	-	870	770	1,640
c. Facilities and Equipment	171	183	-	354	603	957
Subtotal S, DGF	1,041	183	900	2,124	1,773	3,897
4. <u>Evaluation</u>	-	-	72	72	-	72
Subtotal Activities	3,260	1,037	1,800	6,097	10,555	16,652
Procurement Agent and Transportation	795	-	-	795	-	795
Contingency and Inflation	645	263	200	1,108	845	1,953
TOTAL	4,700	1,300	2,000	8,000	11,400	19,400

TABLE 2

INPUTS BY LINE ITEM WITHIN COMPONENTS

Component/Input	Source of Funds					
	AID			Total		Total
	Loan-FX	Loan-LC	Grant	AID	GODR	
(\$ 000)						
1. Technical Activities-						
Public Forest Management						
- Technical Assistance	-	-	504	504	-	504
- Personnel	-	-	-	-	1,534	1,534
- Vehicles Parts	407	-	-	407	-	407
- Heavy Equipment/Parts	768	-	-	768	-	768
- Equipment and Materials	437	120	-	557	285	842
- Operating Costs	-	499	-	499	767	1,266
- Infrastructure	255	30	-	285	450	735
- Services	-	-	-	-	400	400
Subtotal TA-PFM	1,867	649	504	3,020	3,436	6,456
2. Private Sector Development						
- Technical Assistance	-	-	324	324	-	324
- Personnel	-	-	-	-	144	144
- Vehicles/Parts	105	-	-	105	-	105
- Equipment and Materials	172	15	-	187	-	187
- Operating Costs	-	115	-	115	88	203
- Credit Funds	-	-	-	-	5,000	5,000
- Services	75	75	-	150	114	264
Subtotal PSD	352	205	324	881	5,346	6,227
3. Strengthening of DGF						
- Technical Assistance	-	-	900	900	-	900
- Personnel	-	-	-	-	400	400
- Vehicles/Parts	114	-	-	114	-	114
- Equipment and Materials	57	108	-	165	561	726
- Training	870	-	-	870	770	1,640
- Operating Costs	-	75	-	75	42	117
Subtotal S. DGF	1,041	183	900	2,124	1,773	3,897
4. Evaluation						
- Technical Assistance	-	-	72	72	-	72
Subtotal	3,260	1,037	1,800	6,097	10,555	16,652
Procurement Agent and Transportation	795	-	-	795	-	795
Contingency and Inflation	645	263	200	1,108	845	1,953
TOTAL	4,700	1,300	2,000	8,000	11,400	19,400

IV. PROJECT ANALYSIS SUMMARIES

A. Institutional Analysis

1. Introduction and Purpose

The institutions that will carry out this project are the Dirección General Forestal and the Banco Agrícola. In addition, coordination and oversight will be exercised by the Comisión Nacional Técnica Forestal (CNTF), and DGF will coordinate with, advise, and collaborate with other public and private agencies, such as the Secretariat of Agriculture, in a number of activities.

The purpose of this analysis is to provide the institutional context for project management, assess the current and projected capacity of the key agencies to carry out the project, and to establish the rationale for the technical assistance, training, and other inputs planned to support the project.

2. The Dirección General Forestal (DGF)

a. Mandate and Activities

The DGF is the public agency directly responsible for the protection and management of the forest resources of the country. It was established in its present form on April 2, 1962 within the Secretaría de Estado de Agricultura (SEA). The establishment act (Law 5856) describes in detail the functions, responsibilities and authority of DGF, and continues as the primary legislation concerning public forestry matters. In 1967, DGF was placed under the authority of the Fuerzas Armadas to strengthen its ability to protect the forests of the country against invasion by transient farmers and illegal cutting. This change coincided with a ban on all cutting of trees for commercial use, and the closure of the sawmills in the country.

This organizational location was changed through the transfer of DGF in 1982 to the office of the Secretaría de la Presidencia. However, the Fuerzas Armadas still name the Director General of DGF from the ranks of the military. The incumbent while this project was being developed, an Air Force General, showed a strong interest in forestry and conservation matters. Because of this, he was recently named as the Assistant Secretary for Natural Resources in SEA in addition to his responsibilities with DGF.

The mission of DGF under Law 5856 includes:

- Forest management of all timberlands;
- Protection and conservation of the forests;

- Forest fire prevention and suppression;
- Control and supervision of timber cutting;
- Reforestation of forest utilization; and
- Control of the transport and marketing of firewood and charcoal.

In addition, the DGF has responsibility for the enforcement of the forest laws and the prosecution of those guilty of infractions, the levy of use fees and importation taxes, and all programs of forestry research and education.

This broad range of responsibilities goes far beyond the technical forestry programs normally associated with such an agency. Given this wide range of functions (judicial and taxation, in addition to the more common technical role,), it is not surprising that the capability of DGF in the management of lands and forests has been limited.

Because DGF's resources are stretched very thin, and its mandate is so broad, many of its duties are left undone or sporadically done. One example is enforcement of the cutting ban. All forests cannot be patrolled constantly and, when an inspection shows a violation which is prosecuted, the enforcement appears arbitrary and at the convenience of the agency. This does not help DGF's image as a technical organization, nor its ability to assist in such areas as private forest plantation and agroforestry management.

DGF has in fact developed beyond its traditional policing role in recent years, engaging in such activities as reforestation, soil conservation, fire control, and education. Each of these is described briefly below.

1) Reforestation

DGF's work in tree planting has focused on the publicly owned lands of the Cordillera Central, where ownership conflict is absent and soil and water conservation objectives can be achieved. Twenty-one nurseries are reported to have produced 3.1 million plants (2.0 million pines) for this reforestation effort. Trees were planted in 21 different sites on areas ranging from .12 hectares of demonstration to plantations of 244 hectares at Proyecto Novillero (Villa Altigracia). An additional 500,000 trees were donated by DGF to public and private institutions, and to individuals, to encourage private planting and a public awareness of forestry. This reforestation program appears to have been successful as a public education effort, and the pine plantations near Constanza show that DGF has the capability to continue and expand this program.

2) Soil Conservation

Subprogram PIDAGRO was the principal soil conservation action implemented by DGF. This program was started with loan financing and technical assistance from the Inter-American Development Bank, and was designed to extend the life of the Tavera hydroelectric facility through reducing erosion in the upper basin of the Yaque del Norte River. Conservation work included terracing, building check dams and other structures, and planting trees on the public land. The project has had many difficulties, including the physical damage from the hurricanes of 1979, and from the inability of DGF and other agencies to offer support. External funding has now ceased, and the government is unable to continue to finance the project staff and operational costs of the next 10 years in accordance with the agreement with the Bank. As the project was administered as a separate entity within DGF, the experience gained in soil conservation and watershed protection will be lost unless the PIDAGRO staff can be assimilated into DGF.

3) Fire Control

Forty-three forest fires burning 4,438 hectares were reported in 1983. The largest, in Valle Nuevo, covered an estimated 3,235 hectares and attracted national attention. A United States Forest Service (USFS) expert in fire control was brought in to advise DGF on this fire, and reported very favorably on the manner in which the fire was controlled. The performance of DGF in fire control has improved over the last decade. Prior to 1969 an average of 483 forest fires per year were reported burning an estimated 17,900 hectares. Since that date the fires have dropped to an average of 39 per year burning an estimated 4,600 hectares annually. Despite this success, DGF has operated with a severe shortage of fire fighting equipment, vehicles and communication systems. The complete costs of a fire control program, including stand-by costs, cannot be determined without better cost accounting procedures. However, this activity could be expanded, making better use of the limited resources that exist.

4) Education

DGF has begun to exercise its responsibility for national education on forestry and conservation of natural resources. Besides advising on selection of people to be sent abroad for forestry training, the agency runs the Escuela Nacional Forestal at Jarabacoa. This facility is available for training to personnel of other agencies and public groups in addition to providing an excellent site for in-service training of DGF staff.

The need for upgrading of personnel is well recognized by DGF, and a goal has been established of providing a short course to orient every forest guard, or vigilante. Lack of funds closed the school

in 1983, but two courses have been taught to vigilantes in 1984, and the DGF intends to keep applying its scarce funds to this training.

5) Control of Forest Access

The policing of forest cutting and the levy of special taxes and use fees is a continuing program of DGF. In 1983 a total of 2,714 infractions of the law were reported of which 736 resulted in convictions. Illegally cut wood was confiscated in 823 cases, and 16 unauthorized shipments of firewood and charcoal discovered. This activity is the most controversial given the importance of local popular support to the forest conservation functions of DGF.

b. Organizational Structure

1) Present Structure

The organizational diagram on the next page (Figure 3) illustrates the nominal organizational structure of DGF at the present time. There is no organizational manual nor description of unit functions that defines the specific responsibilities of each of the units or sections, and the chart bears little relation to operational capability or program activities. Some of the sections and divisions exist only on paper or have no operating expenses.

In view of the shortage of trained personnel (discussed below), work seems to be organized on a task or project basis by assigning the best person available to the task as it occurs. This is an efficient way to use scarce resources, although it tends to overload the better qualified people. The main work of forest protection and fire control, and the district nursery and planting projects, is performed by the district field personnel under the supervision of the Director of the Technical Department. The Director of the Division of Formulation and Evaluation of projects supervises the Novillero reforestation activities, and acts as the principal technical advisor to the Director General. This system is flexible and effective in emergency situations, but is not conducive to good systematic work planning and control of the use of resources. Under the circumstances, DGF does well to implement the reforestation and fire control programs as effectively as it does.

2) Reorganization Plan

The DGF is presently considering a draft proposal for reorganization of activities that has been prepared by the National Office of Personnel Administration (ONAP), entitled "Estudios de Estructura y Funciones de la Dirección General Forestal" written in July 1983. This work responds to a provision in Decree 752 (February 11, 1983) which required the CNTF to prepare a plan to strengthen DGF to enable it to serve as the executing agency of the CNTF. The ONAP plan is

the latest in a series of such studies that have been made to improve the ability of DGF to carry out its mandate more effectively.

The reorganization proposal of ONAP was professionally done. It begins with a description of the various functions that are the responsibilities of DGF. Suggestions are made on the logical grouping of similar activities, span of control and hierarchy of tasks that should be considered by the management of DGF. In our view, it is overly concerned with structural changes. However, there are two general recommendations of ONAP that deserve special attention :

- To concentrate resources in specialized areas, for example the police or control function in one area and the planning and technical execution function in another; and
- To carry out reorganizations in a phased manner as program functions are added, and staff and financial resources are available for the new activities.

Wide-ranging structural modifications of the agency, if adopted, will have little impact on the operational capability of DGF by themselves, since the basic problems are only partly structural. The ONAP study did not address matters of redefining the mission or priorities of DGF under the present situation of limited resources. The kinds of interventions needed by the DGF are also strongly related to improvements in such management functions as work planning, scheduling, coordinating, and implementing. In addition, the agency needs selective, goal-oriented increases of resources - financial, human, and material.

This project will encourage the hiring of trained technicians and forest engineers to carry out specific activities, in-service training to upgrade current staff, and applied research and extension efforts to increase operational capability over the life of the project. The organization should evolve as operational capability is acquired, and the new programs in forest management, research, and extension are implemented.

A revised structure of DGF based on present operational capabilities and the programs recommended for the Forest Management Project might result, over a five or six year period, in the following functional groupings of related activities:

a) Forest Management Development

Responsible for forest resource utilization and development, plantations and reforestation, silvicultural practices, and

the inventory work and management planning required for operational planning.

b) Forest Extension and Research

Responsible for applied research projects, translation of research into education and extension activities, supervision of the forestry school at Jarabacoa, and other in-service training and specialized technical studies. Research activities would be developed in coordination with other agencies -- national and international -- to make as efficient use of resources and others' experiences as possible.

c) Project Formulation and Evaluation

Responsible for work planning, project development, performance budget formulation, and other technical and information systems required by the Director General and the Division Managers of DGF. This function would also be the point of coordination of all technical assistance activities within DGF. It would prepare work plans and progress reports for internal and external use, and advise management on better use of resources.

d) Forest Protection and Fire Control

Responsible for the coordination of forest protection and fire control activities throughout the 8 forest districts. The leader of this function would be responsible for allocation of vehicles, equipment and manpower among the district offices as required. During fire season, additional personnel and equipment would be made available to this division to meet special problems. At headquarters, this function would also be responsible for charcoal and firewood transport, inspections and wood importation permits, the essential police functions of DGF.

e) Administrative Service and Support

All administrative activities, including accounting, personnel, property management, repair shop and vehicle maintenance, etc. should be combined under an administrator with management experience. Specialized personnel would constitute staff to the Director General -- public relations, legal counsel, etc.

This proposed organizational pattern attempts to group functional activities into logical blocks, reduce the span of control of one manager to five to eight units, and to establish an orderly hierarchy of functions. With limited qualified technical personnel, the managers of these functions should avoid creating sub-units which would tend to disperse scarce human resources and make

coordinated work difficult. Where possible DGF might organize project or task teams as needed.

This kind of reorganization should be developed gradually over time. This project does not intend to take on the entire job, but rather to work intensively with a few new or restructured units to point out how such changes can be carried out and be beneficial. During the course of this project, the organization chart of the DGF will be modified in a modest way, as shown in the chart on the following page (Figure 4). The emphasis will be placed on careful organization and team-building within those units, with the intention that this will have some spill-over effects into other parts of the agency.

While better planning, organization and use of the limited resources and technical personnel can improve capability, this does not solve the basic problem of unqualified personnel, nor the lack of equipment and resources.

c. Personnel and Staff Development

1) Personnel Composition and Administration

The personnel strength of the DGF has increased steadily and a total of 2,114 employees is reported (see Table 3). Most of this growth has been through increased numbers of guards, laborers, and administrative support staff. The professional and technical staff has remained substantially the same over the last several years. At present there is only one professionally trained forester in the agency. This reflects the lack of university graduate foresters in the country as well as the inability of the agency to offer employment to those few that are available. A number of persons being trained in four-year university programs overseas, and in the three year-technical course in Honduras, will be joining the DGF in 1984 and 1985.

The staff of DGF is not classified by position nor are there requirements for specific qualifications or experience for many of the jobs in the agency. No job descriptions or post classifications have been written. ONAP has conducted a study of the qualifications of the staff of DGF, and will be preparing position descriptions in the future. Such a study would be more useful if there were a staffing plan in DGF to which the classification system could be linked and decisions on recruitment assignment and promotion made.

Personnel management within DGF appears to be ineffective, a situation explained in part by the fact that both the Fuerzas Armadas and the Secretaría de la Presidencia are reported to be naming people to DGF without regard to staffing requirements or position descriptions.

TABLE 3
DGF Staff by Title or Function

<u>Title of Function</u>	<u>Number</u>
- Forest Engineers	1
- Agricultural Engineers	1
- Civil Engineers	3
- Lawyers	2
- Surveyor	1
- Licenciados	4
- Dasónomos (3 yrs training)	13
- Forest Technicians (2 yrs training)	31
- Agricultural Technicians	<u>6</u>
Subtotal Professional-Technical	62
- Cartographers	3
- Inspectors	10
- Lumber Control	64
- Administrative Personnel	253
- Drivers and Mechanic	42
- Vigilantes (Guards)	1,140
- Workers	540
Subtotal Subprofessional	<u>2,052</u>
Total	2,114 =====

Source: Prepared by the Chief of the Personnel
Section of DGF, May 1984.

A clear statement of the functions of a position and the skill requirements that are needed for each professional or administrative position could give the managers of DGF an objective basis with which to assess the qualifications of candidates that are proposed. It would also lead to better utilization of the personnel that are with the agency. Technical assistance in administration and management prior to startup of the proposed Forest Management project will advise on the preparation of formal staffing plans for the technical units that will carry out the AID supported activities, and possibly for support units as well. The personnel of ONAP may be called upon to assist and support the post classification and other staff planning activities that are required in DGF.

Since such a large portion of the budgets of DGF is used for payroll, the lack of effective staffing plans and personnel management systems is a serious matter. The general picture of an overstaffed agency with persons untrained in the technical requirements of their work makes it extremely difficult to use personnel resources effectively.

2) Training and Staff Development

Strengthening operational capability is a matter of staff development and training more than of organizational structure and resources. Technically unqualified personnel is a limiting factor in DGF's development, and the solution cannot be massive hiring of better trained people -- they are not available in the country nor could the budget stand it. Large-scale firings are neither politically feasible nor just, and therefore cannot be considered either. Therefore, the personnel of DGF must be upgraded through an aggressive program of in-service training and continuing education. This is a concept that both senior professionals and middle-level managers must support, and in which they will be expected to participate.

The training of vigilantes is an important function that must be continued if the DGF is to impart the basic skills required for effectiveness. It also gives these employees an "esprit" that is vital to their work. Funds from the project will support and extend these efforts. Likewise short refresher courses on fire control and forest protection should be given to laborers and those living near public lands.

More substantive training at the technical and professional level must be provided to Dominicans through scholarships to schools overseas. There are 10 Dominicans studying forestry at the university level at this time, and 20 Dominicans are attending a three-year technical course in Honduras. With or without this project, the DGF has a recognized need to train the current staff of the agency at a more advanced level, and negotiations are continuing with the German

government to support a two-year technical course to be taught at Jarabacoa.

The training component of the project will support strengthening of the program at the Escuela Nacional Forestal for 2-year technicians, in collaboration with other international assistance donors where possible. The school can be used for the extension cursillos of the project, and receive support from research, extension and training experts funded through the project.

In addition to providing scholarships for university training abroad at both the B.S. and M.S. level, the project will support continuing dasónomic training at SNACIFOR in Honduras. Advanced academic training will be given to present staff members of DGF on the condition that they return to work in the agency for a period equal to the length of their education.

d. Facilities, Vehicles and Equipment.

1) Facilities

The principal office and headquarters of DGF, in the Feria in Santo Domingo, is well located and has adequate grounds. A limited maintenance shop facility for the repair of vehicles is located at headquarters.

The headquarters building is the minimum that can be expected for the number of personnel working at the site. While some maintenance and rehabilitation activities are underway at this time, the interior working space and furnishings are not conducive to office efficiency. Professional and support personnel need to have a better work environment and a resulting sense of professionalism.

The district field offices and housing of the vigilantes in the forest are also deficient in terms of the basic structures, and the minimum maintenance that they receive. Repair and painting should be scheduled on a regular basis and every effort made to improve the professional image of the agency in the field.

2) Vehicles

The records of DGF list 47 motorcycles in the inventory, of which 11 are assigned to headquarters and 36 to the field. Of 44 trucks, there are 27 registered in the capital and 17 in the field. Data were not available to determine how many of these vehicles are serviceable -- many are older than 5 years. An additional 12 vehicles from the PIDAGRO project were reported to have passed over to general DGF use, of these only 3 were assigned to the field.

General overhaul and the maintenance of trucks and tractors is available to the agency. This has enabled the older equipment to be kept running. Given the age and deterioration of many of the vehicles it is doubtful that the shop will keep up with the requirements of the service on a timely basis. Field offices generally repair their vehicles locally.

During field visits and in Santo Domingo, constant complaints are heard about the absence of vehicles in the districts for fire fighting and routine forestry work. As an example of how this can cripple a key operation, the major nursery at Valle Nuevo was without a vehicle for transportation of supplies, crew and planting stock.

The allocation and use of vehicles is a major element in the effectiveness of any agency with responsibilities over a broad geographical area. It appears that DGF is inefficient in its assignment of vehicles, and that an operating plan for more rational use and maintenance should be required before new vehicles are supplied through the Forest Management project.

The management of DGF should complete a vehicle status and utilization study, including a survey of the condition of each vehicle, and its maintenance or repair requirements. An allowance for purchase of new vehicles should be included in each budget to assure systematic replacement of wornout vehicles. As the assignment of vehicles to Santo Domingo is so high, the study should analyze vehicle use at headquarters. It might be found that administrative functions could be more economically (and comfortably) handled by passenger cars in the city, and that 4-wheel drive trucks should be placed in field stations. The survey should also identify older vehicles to be used in the capital where the shop can keep them operational, while newer vehicles are assigned to field work.

3) Equipment

Many of the observation and guard posts had no means to contact the district offices or headquarters in the event of fire. The communication systems between the district offices, headquarters in Santo Domingo, and the guard stations and patrolling vigilantes are deficient. Particularly at the time when fire danger is high, and prompt suppression is important to reduce the loss from fire, a reliable communication system is necessary to make use of the limited tools and personnel that are available in remote areas.

Certain types of equipment and supplies are critical to the present program activities of DGF, and will be required to conduct the kind of inventories, plans, and activities envisioned for the Forest Management Project. The basic equipment for present functions includes vehicles for the transportation of fire control crews; radio equipment for communications; fire fighting and other forest practices

equipment; nursery supplies, and equipment for tree planting, etc. These are presently in short supply and poor condition. Property inventory records and equipment lists are inadequately maintained, and there has not been an effort to transfer equipment from the less active areas to those where fire control and forestry work is of higher priority.

Equipment required for the project will include many items that DGF does not now have in its stock, including computers and software for inventories, surveying and drafting equipment, cartographic instruments, dendrology laboratory equipment, and the like.

e. Financial Resources

The regular budget of the DGF approved for 1984 (see Table 4) is appropriately distributed between personnel service costs and other operating expenses. This is a much improved situation from 1983, when 91% of the budget expenditure went for salaries. In the execution of fiscal austerity measures, the Government frequently imposes limits across all agencies on discretionary expenditures, so that execution is much less than appropriations (see Table 5). DGF and other agencies are facing this situation in 1984. The reduction in operating funds and supplies is already reported to be threatening cutbacks in reforestation and other activities.

TABLE 4
Proposed 1984 Budget of DGF
(RD \$000)

	<u>RD\$</u>	<u>%</u>
Personnel Services	\$3,376.0	65.2
Other Services	162.3	3.2
Materials & Supplies	773.0	14.9
Machinery & Equipment	205.0	4.0
Construction & works	315.0	6.1
Current Expenses	<u>342.9</u>	<u>6.6</u>
Total	\$5,174.2	100.0

Source: National Budget 1984, Office of the President.

In addition to the regular budget, funds are available to DGF from other sources. Examples are the PIDAGRO subprogram in forestry, and other natural resource management and energy projects that have a forestry subcomponent.

TABLE 5
Comparison of 1982 DGF Appropriations with Expenditures
(RD \$000)

	<u>Proposed</u>	<u>Expended</u>
Personnel Services	3122.7	3254.0
Other Services	126.0	93.8
Materials & Supply	715.0	414.5
Current Expenses	347.5	119.2
Public Debt	-	10.0
Capital Expenses	<u>110.0</u>	<u>20.0</u>
Total	4420.2	3911.5

Source: National Budget 1982/1983, Office of the President.

A key source of income for the DGF, at least potentially, is the Fondo Forestal that was created under the enabling legislation (Law 5856). This fund is to receive harvest taxes, fines levied for violations of the forestry laws, and the proceeds of confiscated timber sold by the DGF. A national reforestation fund was created in 1979, administered by the Banco Central, that would receive 5% of the net profits of the gold mining enterprise of the state, Compañía Estatal Rosario Dominicana. This has been used to finance training abroad in forestry for Dominicans and for other national activities, and is not for the exclusive use of DGF.

With the prohibition on timber harvest in 1967, DGF's earnings from taxes on lumbering ceased. Better enforcement of the laws resulted in less income from fines and confiscations since that date, and the income to the fund has been insignificant. It is obvious that budgetary levels and other financial resources available to the DGF are inadequate when compared with its mission and responsibilities. If the chronic financial difficulties of the Central Government over the past few years continue, it will be hard for DGF to do other than meet payroll and carry on the current level of activities.

The financial status and prospects of the DGF are discussed in the financial analysis (see D, below: Financial Analysis). The DGF could be in a position to become more self-sufficient in the future, after an achievement-oriented program has begun to take hold, relying on government budgets only for certain basic operating costs, and funding new activities, upgraded equipment and facilities, and other investment activities out of the proceeds of its work, much as the U.S. Forest Service does. Complete financial self-sufficiency may not be a realistic near-term goal, but might be reasonable once the DGF's activities begin to take effect.

f. General Assessment and Recommendations on Institutional Development of DGF

1) Overall Conclusions

The Dirección General Forestal is an agency that has had a history of being primarily a forest police force, and AID and other international agencies have generally regarded it as being an unlikely candidate for major project assistance. As the preceding discussion has shown, DGF is presently going through a period of change for the better, in terms of staff upgrading, high-level government support in both the executive and legislative branches, and changing public expectations as the forestry problem of the country becomes more widely understood.

The analysis has also shown that the DGF remains in need of improvement in nearly all areas, from staff to basic equipment to its general management system. The designers of the Forest Management Project began with a concept of assistance to the DGF in all of its functional areas. On closer assessment, we have found that the DGF has certain functions it performs acceptably, given its limited resources. The agency can continue those efforts, principally in fire control and guarding of forests in most areas of the country, without special assistance. However, if the agency is to take on a serious role in forest management and support for rational private sector exploitation of forest resources, significant institutional as well as material resources will be required, and must be focused on a limited set of activities.

Our analysis then leads us to the following conclusions regarding the institutional agenda for the DGF:

- DGF's efforts are best concentrated in limited geographic areas, and in specific projects, in order to achieve an impact and demonstrate effectiveness;
- New activities will be phased in and expanded as operational capability is acquired through having the basic staff resources needed to

implement, the technology to apply, and the funds to operate those activities;

- Existing activities are better managed by making the most efficient use of personnel, equipment and vehicles that are now available.

We have concluded that the DGF can improve its reputation by learning to do a few programs well, rather than by trying to do all of the things for which it is responsible with equal priority.

2) Specific Steps Needed

- To strengthen the institution, an organizational development plan has to be prepared for those units that are to take on new functions, or to be created under the project. Similar to a forest management plan, this document should assess present institutional capability and resources in depth, set objectives for each activity to be carried out, and establish the schedule for achievement of these goals. This plan will be the basis for staff development and training programs, planning of technical assistance, budget development and management, and must follow the guidelines established in the National Forestry Strategy;
- As significant increases in DGF's budget for either personnel or operational activities are unlikely, the above should include steps needed to upgrade present staff and improve current operations;
- Better operational performance can be achieved by DGF within the limits of current resource levels through improved management, work planning, assignment of priorities and focused effort. Accordingly, project assistance must provide opportunities for DGF managers to improve their skills in these areas;
- A DGF personnel administration plan is essential for the units that will carry out the forest management, applied research, and extension work. This plan would establish the duties and requirements of each of the positions within the affected units. The plan and job descriptions would cover the skilled

workers in the field and in the district offices, as well as those in central units. Establishing these criteria for each position would help to define the in-service training requirements of the agency and to measure the growth in professionalism required to increase operational effectiveness;

- A review of the scope of responsibilities of DGF in the light of resource availability should be made as a continuing management process within the agency, particularly at the time of budget formulation. As the Forest Management Project's influence is felt over time, these project-specific steps might evolve into a general organizational development plan for DGF that would guide management in the allocation of resources -- personnel and financial. In-service training and staff development activities would be key elements in organizational development beyond the life of the project;
- The experience in soil conservation and watershed management development gained through PIDAGRO must be captured by DGF, and the staff and equipment absorbed into the agency. Future projects receiving foreign assistance should be designed to strengthen the responsible units directly, rather than diluting scarce personnel and financial resources with independent activities or units;
- The facilities of the DGF must be improved, the vehicle resources expanded, and the equipment stock of the DGF strengthened with funding from the Forestry Management Project, as needed to achieve the limited, defined aims of the project. The project will include amounts to improve radio communications for the project areas. Adequate maintenance and repair funds are to be budgeted to keep the above resources serviceable;
- The reforestation program should be strengthened and the general recommendations of the United States Forest Service regarding fire control will be applied in limited areas which can be effectively protected against fire and trespass, and ultimately brought to a stage of

multiple use management. The lessons learned in limited areas can then be extended to other regions of the country. In these activities, technical assistance should be provided to make better use of the vehicles and equipment that are available. An improved fire detection and communication system would enable prompt attack to reduce the loss from uncontrolled fires.

g. Project Management

Two alternatives for the management of the project were considered; the establishment of an independent project unit within DGF reporting to the Director General, or merging the project activities into the functional organization of the agency.

The first alternative has the advantages of concentration of effort, independence from DGF bureaucratic routine, and direct access to the executive to assure support and coordination. This alternative would also allow DGF and USAID to better control the resources provided by the project and to follow the progress of activities. A disadvantage of the independent project approach, which was experienced with PIDAGRO, is the difficulty of absorbing the staff and functions of these specialized activities once the project and external funding ends. Also, the experience gained as the work advances is not institutionalized by the agency, and therefore does not increase general operational and organizational capability.

Therefore, we have agreed with the DGF that the management of this project will be located within the Division of Project Formulation and Evaluation of DGF. Separate accounting functions for project funds, bank accounts, and petty cash will be established in the Administrative Division in order to maintain the fiscal controls required by AID. Implementation of project components will be accomplished through the existing Technical Division, and support offices as required. This alternative may be slower to arrange at the beginning; however, it appears to offer the best possibility for strengthening the capabilities of DGF --a principle purpose of this project.

A third alternative of locating the project directly under the CNTF was also considered. The only advantage identified in this arrangement would be the inter-agency coordination that might be achieved. Otherwise, the non-technical and non-operative nature of the Commission, and the uncertainty about its role and functions, would offset this advantage. (See following discussion of CNTF.) The disadvantage of separation from day-to-day operations of DGF might be significant.

h. Technical Assistance

A large technical assistance component is recommended and planned for this project, given the range of areas requiring intervention, and since activities will be almost all new to DGF. Although there will soon be an infusion of new forestry graduates and technical foresters to the DGF, these individuals will lack the experience that seasoned foresters or expatriate advisors would be expected to bring.

Based on the needs summarized above, long-term technical assistance will include at least one forestry management advisor and chief of party for the life of the project, preferably someone with extensive experience in institutional development. Also required as long-term technical assistance are: a forestry extension advisor to work with private sector development and promotion, a research silviculturist to organize applied research to support extension and training priorities; and a forest management planner to supervise the development of the plans for the two forest development zones.

Specialized short-term technical assistance will be required for market development of forest products; fire control training and plan development; mapping, inventory and boundary demarcation; credit fund establishment and operations; planning and plan implementation; and project evaluation.

The phasing of this technical assistance will depend to some extent on the availability of counterpart staff in DGF, although long-term advisors will initially be working with several of the present staff to get project activities under way. Technical assistance should be accompanied by a major in-service training program for existing and new DGF personnel.

3. Banco Agrícola

a. General Capacity

The Agricultural Bank (Banco Agrícola, or BAGRICOLA) was created in June, 1945. It presently has 31 branches and 53 satellite offices. The loan portfolio has grown from RD\$48 million in 1962 to RD\$251 million in 1982. During the 1979 - 1982 period, approved loans averaged RD\$159 million, of which RD\$127 million was disbursed, and RD\$88 million (70%) recuperated. The interest collected on loans during this period was RD\$13.5 million, while expenses averaged RD\$15 million. The bank has been operating with subsidized interest rates, performing a combined banking and social development role, meeting credit needs often bypassed by commercial banks.

Because of its dual role, and a large delinquent portfolio, the BAGRICOLA has operated for most of the last few years at a

significant loss, and is now engaged in a major effort to collect on overdue debts, improve its liquidity position, review its interest rate policy, and perhaps to revise its lending criteria. At present, the Bank is the only credit institution that finances the production programs of the agrarian reform programs. The guarantees requested by the Bank are liberal, and do not usually entail the pledging of land or other property as collateral, in contrast to those few commercial banks (largely expatriate) that engage in lending to the agricultural sector.

b. Project Involvement

The BAGRICOLA has been assigned the principal role to channel the credit component of the Forest Management Project because of the following advantages it provides over the commercial banking system:

- It provides the greatest coverage of the potential lending organizations, with branches and offices readily available to the selected project areas;
- Its basic charter, lending requirements, and operations are inclined toward small and medium scale agriculturalists, without excluding larger-scale clients;
- Under the AID supported NARMA project, BAGRICOLA has developed staff who are trained in proposal evaluation techniques to respond to loan applications backed by natural resource plans; and
- As the country has no recent history of managed forest exploitation, the lending activity can be limited initially to the project zones, (in cooperation with the BAGRICOLA), and tied to forest management plans.

We expect that the \$5 million to be made available under this project will be well utilized, in accord with the objectives of the project, by the BAGRICOLA. Once a track record has been established, and the feasibility of such lending as has been demonstrated, we anticipate that the private sector banks would open windows for this kind of lending, within the framework of the National Forest Strategy.

4. Coordination and the CNTF

There is some overlap of functional responsibilities and program activities of DGF with other natural resource agencies, though in forestry the DGF has a major mandate. Coordination between agencies and the implementation of joint activities will permit the scarce technical

skills and resources of agencies with related functions to be more effective.

In this regard DGF is cooperating on many projects of other institutions and agencies. The 13 dasónomos on DGF payroll are presently the leading technical staff of the agency. Four of them are assigned to the Plan Sierra project of SEA, and one is assigned to the National Energy Commission to work on fuelwood plantations. DGF also provides vigilantes to the Parques Nacionales, and cooperates with other public and private agencies by providing trees for planting and other services. In fire control, protection of the forests from illegal cutting, and other violations of the law, DGF in turn receives assistance from the Policía Nacional. The Armed Forces also have helped control major forest fires on occasion.

This cooperation between agencies is not formalized and cannot be planned. In times when all agencies are short of funds, collaboration is more difficult to achieve, and a more formal coordination mechanism is needed.

The National Technical Forestry Commission (CNTF) was organized by the Office of the President of the Dominican Republic to bring about a consensus on national forestry policy, and to foster cooperation among public agencies. It is difficult to assess how effective this body has been. Despite its name, the commission is more political than technical in membership. It is composed of the Secretaría Técnica de la Presidencia, the heads of DGF and Parques Nacionales (neither of whom is a forestry professional), and by the directors of planning, development, and agricultural agencies. At present, no representatives of rural community interests or of other private sector groups are included.

The CNTF can be an appropriate forum for policy discussions, for advising the President, and for inter-agency cooperation. However, the legislation (Law 705) contains contradictory provisions, and it is uncertain whether the CNTF may have executive functions in addition to those of policy formulation.

The consultative function in policy determination is important and it should be used to define general policies and operational guidelines, and to encourage interagency agreement and collaboration. As the DGF proves it can perform as an implementer of technical forestry activities, the CNTF can reserve its scope to advice and oversight of matters of interagency importance.

B. Technical Analysis

1. Introduction

The technical activities of the Forestry Management Project as compared with those outlined in the PID, have been scaled down and isolated to two primary geographic areas, each encompassing a major public forest and the private lands suitable for forestry or agroforestry which surround the public land. The public forest will be designated national forest reserve and the areas including private lands will be designated forestry development zones. This focusing of project technical activities results from the following: a) the limited technical and institutional experience and capacity of the sole forest service in the Dominican Republic, the Dirección General Forestal; b) the age and detail of the data base on forests in the D.R.; c) the lack of private sector knowledge of forestry, particularly forest management; and d) the limited funds available to DGF for operating expenses.

In order to accomplish the field activities described below, considerable expatriate technical assistance will be required early in the project implementation process to guide and advise newly trained DGF technicians and professional foresters, who have little practical experience. To strengthen DGF institutionally and to convert it to a technical and service agency, much advanced degree, bachelors and technician training will be necessary under the project. This ambitious undertaking is practicable with adequate expatriate technical assistance, timely provision of inputs, and proper phasing of project activities using a learning process approach.

2. The Geographical Foci

Two areas have been pre-selected as the foci for the initial practice of public forest management in the Dominican Republic. Selection was made in collaboration with DGF technicians and management based upon forest inventories performed by FAO in 1969, recent aerial photographs provided by the USAID's NARMA project, and site visits in early May 1984. (See Annex H-8 for selection criteria matrix.) Both areas have relatively good though limited road access, are recognized as public forest land, have marketable timber, and are good candidates for working laboratories because of the variety of silvicultural treatments required.

a. Sabana de San Juan

The Sabana de San Juan area lies on the southern fringe of the Cordillera Central and encompasses approximately one-third of the important Sabana Yegua reservoir watershed. This area is remote and comprised of several mountainous pockets of dense pine forest totalling at least 5,000 hectares and 28,000 hectares overall. Soils in the area are relatively fertile, but are steep and undulating. Hurricanes David

and Frederic caused considerable damage in 1979, and DGF subsequently removed most of the salvageable timber. Recent migration to the surrounding lower elevations has resulted in increasing encroachment on public lands by shifting agriculturalists (conqueros) and cattle grazers.

Several distinct advantages are presented by work in the Sabana de San Juan. The stands of pine offer marketable timber for immediate exploitation without significant damage to the watershed. Because of the variety of ages, densities, levels of damage, slopes and soils, the area offers an excellent opportunity to demonstrate silvicultural treatments directed toward watershed improvement and enhanced productivity. Socioeconomic conditions in the nearby areas demand an extension and community relations approach which will include local residents in the development of the forest potential of the area, from zoning and planning to harvesting and processing. In essence, Sabana de San Juan is quite typical of many areas in the Cordillera Central and the management scheme developed here may serve as a model for future DGF work there.

b. Sierra de Bahoruco

The Sierra de Bahoruco public forest area is much larger, 40,000 forested hectares, than Sabana de San Juan. As a single, individual expanse in the Pedernales peninsula, it has suffered less from encroachment, though some is occurring in the northern sections. Conditions in this forest vary greatly in density of stands, age of trees, value of timber, soil quality and rainfall, though this is predominantly a pine forest with some hardwood stands. Much of the marketable timber is in the south and southwestern portions of the forest, where access is more limited. Several areas have been heavily damaged by wildfire and hurricanes, other areas were logged less than twenty years ago and are far from mature. Based on FAO data and field inspection, the Sierra de Bahoruco appears to be a slow-growing forest which is understocked and badly in need of silvicultural treatment.

The Sierra de Bahoruco forest also offers technical and management opportunities. The scale and relatively uncontested nature of the area presents a good chance to preserve a large portion of potentially productive forest. A considerable volume of revenue-generating timber is available for exploitation with appropriate management. Like Sabana de San Juan, a variety of silvicultural treatments are needed here and the forest's value will be greatly enhanced, as it will respond to treatment with improved productivity and environment. Significant potential exists here for agroforestry, forest grazing and fuelwood applications in the public forest and on nearby lands.

3. Technical Activities for Public Forest Management

One of the two areas, Sabana de San Juan or Sierra de Bahoruco will be selected as the initial area for public forest management under the project, with the second area phased in later in the project as DGF demonstrates capability to develop a management plan and implement it. Selection of the site will be based upon a comprehensive inventory and analysis of both areas to be completed prior to project implementation. This detailed inventory and analysis will include the following, which are further explained in Annex H-3: land tenure, forest cover, size, access, topography, site specific information, forest condition, utilization options, critical areas, silvicultural treatments, infrastructure needs, human factors, development and conservation potential. This on-the-ground assessment will be carried out with DGF technicians by a team from Michigan State and Ohio State Universities prior to project implementation under NARMA project funding. Immediately following selection, the Comisión Nacional Técnica Forestal (CNTF) will draft legislation for GODR congressional designation of the area as a national forest reserve. This designation will be as precise as possible, given knowledge of the boundaries and land tenure conditions.

a. Comprehensive Inventory

The process described above is critical for adequate development of management plans for national forest reserves. The two assessments made during pre-project planning will be carried out principally by expatriate technical assistance. By the fourth year of the project, DGF will have adequate technical capacity and experience to perform such an assessment. A third site, preferably in the Cordillera Central, will be selected during the project for treatment after this project ends.

b. Public Forest Land Demarcation

Legal definition of the national forests will be of little value unless the boundaries are physically demarcated on the ground and patrolled regularly to discourage encroachment. Demarcation will begin around areas of heaviest concentration of people by painting trees at regular and close intervals. Concrete markers will be placed at key locations. Signs will be posted along roads and trails to advise visitors that they are entering a national forest and that timber cutting, land clearing, burning and livestock grazing are prohibited. People living in the area will be informed and forest guards will patrol the boundary regularly.

c. Management Plan Development

Management plans for the selected forest will be drawn up first, based upon the comprehensive inventory and analysis. The development of the first plan will require extensive expatriate technical

assistance and will be a significant learning experience for the Dominican technicians who will work with them. The plan will be flexibly designed in accordance with the intensity of use and the resources available to DGF under the project. General guidelines for the development of such a plan are included in Annex H-4.

d. Management Plan Implementation

The precise nature, extent and intensity of the field activities to be undertaken will be determined by the comprehensive inventory and pre-plan analysis. Anticipated activities, however, include natural regeneration, forest plantations, timber stand improvement, agroforestry, fire protection and forest grazing. These activities will be supported through the project in the selected natural forest and on private holding suitable for forestry applications within the forestry development zone. Activities will begin initially in only one forest and then in year three in the second site.

1) Natural Regeneration

Most pine forests regenerate well naturally under good silvicultural management. This will be a highly effective and inexpensive means of reproducing the forest. Based on site visits to Sierra de Bahoruco and Sabana de San Juan, it is apparent that Pinus occidentalis is capable of good natural regeneration following logging and fire, and this technique will be applied in both forests.

2) Forest Plantations

Regeneration by planting will be a major field activity to be undertaken by DGF. Many sites within both of the two national forests are entirely deforested or severely understocked with no ready seed source for natural regeneration. These sites will require reforestation by planting.

Forest plantations offer a number of important advantages over natural regeneration. There are the opportunities to control stocking densities and the seed source, including its genetic quality, and to introduce non-native specie provenances. Most planting will be done with the native Pinus occidentalis, but other pines will be considered by silviculturalists depending upon forest conditions.

3) Timber Stand Improvement

Various types of timber stand improvement will be necessary during the management of the national forests. Both the Sierra de Bahoruco and the Sabana de San Juan contain many over mature, badly formed trees which were left as residuals following harvesting operations. Other trees have been severely damaged by wildfire or hurricanes. Most of the damaged trees in both areas are poor seed sources and are hosts for bark beetles. They will be removed in salvage operations or otherwise destroyed.

4) Agroforestry

In and around the selected national forests, agroforestry will become an important means by which DGF can involve local people in forestry practices. This will not only contribute to a reduction in encroachment but also to increased wood production and environmental improvement. In the areas immediately surrounding the forests, it is necessary for DGF to provide forestry extension services. This will take the form of advice on tree planting on farmers' private holdings. Currently, DGF has little experience in agroforestry. It will need to be strengthened through research, training and technical assistance, and this activity will begin later in the project.

e. Fire Control

Fire control is a major preoccupation of the DGF, especially in the pine region. During the 2-4 month fire season, much of the time of forest guards is spent patrolling for fires. Given the limited resources available, DGF does a commendable job in controlling forest fires. Nonetheless, there is room for substantial improvement and need for equipment.

Fire prevention and control will be important components in the Forest Management Project. Under the project, intensive fire protection will be supported in national forests and surrounding areas. In addition, throughout the pine regions of the Cordillera Central and the Sierra de Bahoruco, the project will provide needed communication equipment, such as radios or field telephones to forest guards to report fires.

Both public and private forest land in and around the project area will receive strengthened fire prevention and control services from DGF. These services will provide important incentives to the private sector to invest in forestry and be an important means to employ and involve community members.

f. Applied Forestry Research

Management of both public and private lands in the Dominican Republic has been inhibited by a lack of technical information. Some of this information is now being generated by the Instituto Superior de Agricultura (ISA) for energy plantations through the AID-funded Energy Conservation and Resource Development Project. For the public sector, the experience is being gained by DGF on forest plantation establishment and fire control. There remains, however, a dearth of information on species-site relationships, seed sources, growth and yield, plantation management, the suitability of different tree species as components in agroforestry systems, and the profitability of growing wood as a cash crop.

1) Research Management

The objective will be to develop within all DGF professional and technical staff a research mentality or at least an inquisitive approach to forest practices. Research will be seen as a facet of all major technical activities of DGF: silviculture, inventory, fire management, etc. One expatriate professional trained in research techniques will be charged specifically with encouraging and advising on research.

In its initial years, this project will support the education of at least one forester in research techniques. Upon completion of studies, this forester will return to the Dominican Republic to work with a technical assistance forester in developing research throughout the DGF.

The research foresters (one Dominican and one technical advisor) will work closely with the extension unit. This will help ensure that research undertaken is of an applied nature directly focused on practical problems. They will have three main functions: (a) teaching at the forestry school in Jarabacoa; (b) coordination of forestry research among different agencies; and (c) initiation of research throughout DGF. The research foresters will also promote greater communication among organizations engaged in forestry research. Among the organizations active, at various levels, in forestry research are ISA, Plan Sierra, Falconbridge Dominicana, Rosario, Prograssio and a few other private firms.

Most important, research throughout DGF should be encouraged, promoted and facilitated by the research foresters. This will take the form of assistance to field foresters (professionals and technicians) in conceptualizing, designing and managing applied research. Field work will be concentrated in the two forestry development zones, with one station established in each zone headed by a dasónomo with assistance from two peritos.

2) Research Topics

Research undertaken by DGF will be designed to benefit both public and private sector forestry. Research topics identified as high priority by DGF and which will begin under the project are:

a) Species-Site Studies. Replicated species and provenance tests will be designed to test a variety of seed sources from selected species on the range of site types likely to be available for planting in the national forests. Species to be tested will be selected based on their potential to produce sawtimber, fuelwood or multiple products or to slow soil erosion. The studies will be designed to complement those already initiated by ISA, Falconbridge, Rosario and other organizations. Where possible, identical statistical

design will be used. Consideration will also be given to designing the studies in a manner complementary to those being managed by CATIE in Central America.

b) Growth and Yield Studies. Permanent sample plots will be established in the major native forest types in the project area, for regular, periodic measurement to gather data on tree growth and yield. Different site types and age classes will be represented in the studies. An effort will also be made to locate and remeasure the FAO plots established around 1969-1971.

c) Natural Regeneration. Studies and observations will be made of the capacity of native forests to regenerate themselves naturally following fire, logging, hurricanes or other disturbances.

d) Agroforestry Systems. A series of studies will be installed on small, private holdings to test a range of agroforestry practices such as live tree fences, woodlots, planting, windbreaks and intercropping trees and agricultural crops in the forestry development zones. The studies will aim toward self-sufficiency in fuelwood and some production of other marketable wood products as supplements to traditional agricultural crops. These agroforestry farms will be concentrated around the national forests. Their design will incorporate experience already gained by Plan Sierra, the NARMA project and Progressio.

e) Mass Seedling Production. The current nursery practice in the Dominican Republic of growing tree seedlings in plastic bags is acceptable technology for the present planting rates. If planting is increased greatly, however, it will be desirable to develop other systems which allow for the transport of greater numbers of seedlings at less cost. Plug systems such as that being developed by Progressio, offer such advantages. DGF will undertake itself, or contract for, applied research comparing the costs, survival and early growth of seedlings grown in plastic bags and as plugs. The more promising tree species will be tested, with out-planting done in the project area. A cooperative research project with Progressio will be explored.

f) Social Problems of Forestry. To support outreach activities in the general area of the national forests, a study of social customs and views of local inhabitants toward conservation work will be undertaken with expatriate technical assistance. The objective will be to gather information which would help motivate farmers to support government-sponsored forestry activities, and to make DGF technicians more aware of the interests, needs, and resources of the communities in the zones.

g. Extension

A major objective of this project is to begin to shift the focus of DGF from protection and vigilance to one of increased

responsiveness to the needs of the general public. To do this, the project will contribute to the creation in DGF of a new central office unit dedicated to extension. Long-term technical assistance will be provided to the central office. Field activities will be phased to begin in coordination with operations in the forestry development zones, under the direction of the field offices.

The extension unit of DGF will have primary responsibility for 1) reviewing private forest management plans, 2) providing public awareness, and 3) providing technical information to the general public. These extension services will be made available not only to private landowners (both large and small), associations and potential investors, but also to universities, private foundations and other government agencies, as well as to the staff of DGF. As with research, the extension unit will seek to instill in all DGF staff a responsiveness to the needs of the general public.

A major activity of the extension unit will be to participate in the review of forest management plans submitted to DGF by private landholders. According to law, these management plans must be approved before harvesting permits are issued. The extension unit will provide advice and assistance to landholders on how to develop an appropriate management plan which will not only meet with DGF approval, but will facilitate economically and environmentally sound management of the land.

The major information and awareness needs to be met by the extension unit are:

1) Laws and Decrees. Currently, there is much confusion and misinformation among the general public, and even among foresters, about the laws and decrees affecting forest land. The extension unit would provide such information.

2) Sources of Credit. An increase in requests for credit for forestry practices will occur in the coming years. The extension unit will act as liason between landholders and other potential investors and the Banco Agrícola offices to be established in the forestry development zones.

3) Markets. Supply and demand information for wood products will be collected and interpreted by the extension unit to help identify markets for domestically produced wood.

4) Profitability of Wood Production. The extension unit will maintain data on the costs and returns from the major forestry practices in order to provide information on the profitability of growing wood.

5) Pine Forest Management. Advice and information on silvicultural practices appropriate for natural pine forests in the Dominican Republic will be available from the extension agents.

6) Forest Plantations. Information will be disseminated on forest plantation establishment and management, including species, sources of seedlings, planting and tending techniques and end product uses.

7) Agroforestry. Special information on growing wood on small farms, intercropping, windrows, boundary planting, live fences and, small woodlots will be made available to rural people.

The above and related information needs will be met by the extension unit central office by:

- Establishing contacts and regular communication with foundations, associations, landowners organization, and groups to promote forestry and to assist them in designing forestry development projects;
- Organizing seminars, workshops and meetings for people at all levels (bankers to farmers) interested in forestry investment opportunities;
- Compiling and distributing leaflets and other small publications written in clear and simple language;
- Providing accurate information to the news media, including educational radio programs on forestry practices; and
- Giving short lectures in the forestry school, technical and professional, about extension activities and the need for foresters to be responsive to the public at large.

4. Conclusion

Presently DGF is a technically weak organization operating in a country with no tradition of forestry and a data base which was developed by expatriates and is now in need of updating. However, a very positive trend has begun toward strengthening the technical capacity of DGF and expanding its field operations. The young technicians and foresters who have returned in 1984 or who will return in 1985 are well trained, but in need of practical field experience with the guidance of senior foresters. Public interest and support for forestry in the Dominican Republic is at a high point and private investors appear to be eager to invest in forestry, but lack sound technical knowledge and experience to act confidently.

1985 are well trained, but in need of practical field experience with the guidance of senior foresters. Public interest and support for forestry in the Dominican Republic is at a high point and private investors appear to be eager to invest in forestry, but lack sound technical knowledge and experience to act confidently.

The Forestry Management Project is technically feasible. The large component of technical assistance, 168 person-months in all, will be concentrated in the beginning of the project to assure that the planning, research, extension, and forest management activities of the project are well designed and that implementation is well managed during the critical early stages. This period of intense expatriate technical assistance will be a final, on-the-job training phase for the newly returned DGF technicians and foresters, which will enable them to carry on themselves in the future. An extensive training program for M.S. specialists, B.S. foresters, and technicians will greatly enhance DGF's capacity. With the strengthened fire control capability, and newly developed research and extension units, DGF should have the skills, experience and knowledge by the end of the project to move beyond the areas of Sierra de Bahoruco and Sabana de San Juan with these efforts. Finally, the pilot public forest management begun in the two national forest reserves will provide both a valuable demonstration of technical forestry to the private sector and a working laboratory for DGF to further develop its expertise, providing a firm knowledge base for later expansion to other forest reserves.

C. Economic Analysis

1. Summary

Based on the analysis of economic aspects of the Forest Management Project, we have concluded that the project, if properly and effectively implemented, will provide significant economic benefits to the Dominican Republic. Financial and economic internal rates of return were calculated for a number of probable forestry production activities to be supported by the Forestry Management project, and ranged from a very conservative 12%, to over 50%. This indicates an excellent economic basis for undertaking this project, both for private investors and for the GODR.

Relaxation of the policy banning harvest of trees in the country opens the door for significant import substitution and employment creation. The country will face critical foreign exchange and employment problems over the next decade; thus, prospects for saving foreign exchange, creating jobs and at the same time protecting agricultural soils and watershed values through the activities supported by the project will be of great interest to the GODR.

2. Purpose

The purpose of this economic analysis is to evaluate the project's viability as an investment option for the intended beneficiaries (rural poor and private producers) and for the GODR.

3. Assumptions

This economic analysis is based on the following important assumptions:

a. The project is designed with a heavy investment of technical assistance at the front end, since the DGF at present does not have manpower to implement a production/conservation oriented program such as proposed for here.

b. The technical assistance will focus strongly on building up managerial capabilities and attitudes as well as on professional and technical forestry.

c. The project staff and decision makers will constantly keep in mind the practical production and goal-oriented philosophy which underlies the project concept.

d. As forests are opened up for increasing harvest, the destructive exploitation which characterized the DR forests in earlier days will be guarded against by DGF to avoid a negative public reaction. This approach is meant to give the DGF public forestry program a foundation of cooperation and trust, rather than one of policing and conflict management.

e. Contracting with the private sector and non-DGF institutions to provide services -- training, research, planting, timber harvest, range development, etc.-- will be pursued wherever possible to contribute to creating an environment of mutual trust between public sector and the private forest based sector.

4. Economics of Project Components

Support for a number of productive activities is included in the Forestry Management Project. These include development of two large-scale natural forest management areas, private non-industrial afforestation for various products or outputs, public reforestation, and several other activities. The question addressed here is whether or not these activities could be expected to provide reasonable economic internal rates of return that would justify their support.

Limitations on the availability of local empirical data require that this discussion be based on representative models drawn from experience under similar conditions elsewhere in Latin America, as well

as plans prepared for comparable areas in the Dominican Republic. Conditions in the project areas vary widely from one location to another, due to varying slopes, distances from markets, soil conditions, etc. These will produce varying rates of return associated with the same activity when it is developed in different locations. Thus, the investment models developed here will by necessity be representative of "typical" conditions.

Information on expected rates of return from investment in reforestation under conditions similar to those found in the project areas has been built up in other countries over the years.

Available evidence indicates that under the types of conditions existing in the Dominican Republic, and particularly in the two project areas -- pine lands with average potential plantation yields in the 5-10 cubic meters per hectare range, import substitution as the main intended focus, local labor and landowners who can contribute land and work, and a situation where there is a current underinvestment in forest-based activity -- very acceptable rates of return can be obtained, both in financial terms and in economic terms. The latter rates can be particularly high if off-farm benefits associated with soil and watershed protection are included.

The principal forest production activities expected to be undertaken by the private sector under this project, in order of probable investor interest, are (a) natural pine forest utilization; (b) fuelwood plantation; (c) mixed fuelwood/pine plantation; and (d) private pine plantation.

a. On-Farm Net Benefits

1) Natural Pine Forest Utilization

One of two field areas with existing pine forests will be chosen for management demonstration on the basis of comprehensive inventories. For the purpose of illustration here, an area of approximately 2,100 hectares has been assumed, and a representative model of development has been generated, relying heavily on the 1982 "Plan de Manejo" (Management Plan) for the Celestina area within the Plan Sierra region (Swedforest Consulting AB, Dec., 1982).

Physical input and output assumptions were taken directly from the Celestina Management Plan, as were skilled labor, administration, supervision and equipment costs. Unskilled labor was shadow priced at RD\$4.00 per man day. This is about one half of the wage paid by Celestina to unskilled workers (Plan Sierra has rural development objectives well beyond forest management, and feels the higher, subsidized wage is justified in support of those objectives). RD\$4.00 is close to the current minimum wage of RD\$6.75 and more representative of typical wages than is the Celestina figure. The wage of RD\$6.75 per day

was used for the financial analysis. With the devaluation of the peso to around RD\$2.50 per US\$1.00, the minimum wage in pesos will increase and the RD\$6.75/man-day will be about right during life of project.

To estimate project impacts in economic analysis, the "with and without approach" is used. Since there is little if any basis for projecting the "without" situation in this case --other than to point out the encroachment and (low value) use of the trees would most likely occur without the project in almost any area finally chosen-- a liberal RD\$100 per hectare per year opportunity cost was included to represent the without project benefit (actually opportunity cost or benefits foregone). This is predicated on the assumption that the GODR would not permit existing trees to be cut and sold without the project, an assumption substantiated by DGF.

On the benefit side, unit values for poles, post and fuelwood were conservatively taken from the Celestina Management Plan. The shadow price for sawnwood was assumed to be around RD\$1.80 per board foot, taking into consideration that the project output would substitute directly for imports. The financial rate of return of over 50 percent and the economic rate of return achieved of 43 percent (see Annex I-2) are high and indicate that there will be strong interest in exploitation of existing natural pine forests under the project.

2) Fuelwood Plantations

It was not possible with the data available to derive precise economic rate of return estimates for possible activities such as fuelwood/charcoal production under this project. However, analyses exist for some case examples from the DR. These provide indications of what might occur under the project. For example, the results from a 1984 summary from INASCA (Industrias Asociadas, CxA --a private company) show a financial internal rate of return of 20 percent and an economic rate of return of 37 percent for eucalyptus plantations for charcoal production (see Annex I-3). The limited data made available by this company do not permit duplication of the cash flows or tracing through details of the analysis. However, the information provided (yields, price assumptions) indicates that conservative values were used. IRRs of the magnitude calculated by INASCA, indicate a strong economic incentive for private sector participation in fuelwood production.

3) Mixed Fuelwood Pine Plantation

An analysis made by Plan Sierra of a 38 hectare family operated hardwood and pine plantation operation (for production of poles, posts, charcoal and eventually sawlogs) shows an economic rate of return of 14.1 percent and financial rates of return of 18.2 percent (see Annex I-4 and I-5). Again, rates of return of this magnitude compare favorably with other investment alternatives in the Dominican Republic,

and indicate that private sector participation should be active in mixed fuelwood-pine plantation investment.

4) Private Pine Plantation

The area being planted is assumed to be a medium site for *Pinus Occidentalis*, i.e., about 8 cubic meters (8M³) per hectare per year growth, plus some production of minor forest products through thinning (e.g., posts, fuelwood). See Annex I-6 and I-7. The shadow price for labor is RD\$4, as explained in the previous section. Similarly, the assumed RD\$69 per cubic meter stumpage is considered conservative in terms of what is expected in the future, at an exchange of RD\$2 - US\$1 or higher. In the economic analysis (from the national point of view) an overhead and extension cost was included.

Given the cost and return assumptions specified, a financial rate of return of 11.9 percent and a economic rate of return of 12.2 percent were obtained. This is in the range of returns obtained for many other plantation examples in the Caribbean region. It should be noted that off-farm conservation benefits have not been included. These would raise the economic rate of return.

- Economic Sensitivity Analysis

- a) Assume first sawlog yield occurs in year 20 and second in year 25; RD\$56 cost in each of intervening years:

New IRR : 10.9%.

- b) Assume year 0 costs go up to RD\$5,000 or RD\$500/ha with yields as in 1 above; i.e., in years 20 and 25

New IRR : 9.6%

All of the EIRR's indicate that while plantation pine production is not as profitable as utilization of existing pine forest, pine plantations should be a viable forestry alternative for DGF to promote among private sector investors. On better sites (i.e., soil, rainfall), rates of return should increase significantly.

b. Added Off-Farm Net Benefits

The above calculations are based only on "on-farm" benefits and costs for the sites on which the different forestry activities would take place. However, substantial off-farm benefits and cost reductions would result from well managed forestry activities implemented on hilly or mountainous terrain. Analytically, these added

net benefits would manifest themselves in substantially increased economic internal rates of return. In terms of policy, these benefits provide justification for possible GODR subsidies for forestry activities on steep land with slopes over 20%, which includes most of the land in and around the two project field areas.

As noted in the NARMA Project Paper (p. 93), major off-farm benefits of properly managed hillside forestry activities can include reduction of adjacent farm erosion/yield loss, reduction of flood damage and infrastructure maintenance cost, and reduction of loss of reservoir and irrigation canal useful life.

These off-farm net benefits are difficult to estimate and attribute to specific on-farm activities. However, based on the NARMA analyses, it is expected that net benefits attributable to the Forestry Management Project would be doubled if off-farm net benefits were added to those of the on-farm net benefits discussed in the previous section. Considering that EIRRs calculated above and based on on-farm benefits ranged from 12 percent to over 50 percent, and that adding in off-farm net benefits would double total project-induced net benefits, the resulting project impact EIRRs would all be expected to be over 24 percent.

These calculations lead to the conclusion that the project would be an excellent investment for the GODR, and that private investors should find commercial forestry to be a very viable investment option. The other side of the coin is that failure to implement the project would at best perpetuate underutilization of the Dominican forest resource, and at worst condemn thousands of poor hillside campesinos to increasing poverty and eventual out-migration to slums of cities.

5. Additional Considerations

a. Foreign Exchange Earnings and Import Substitution

Imports of forest products in the Dominican Republic are around US\$70 million per year, of which about \$45 million are pulp and paper products and the rest consists of various wood-based products, including timber, lumber and plywood. Further, imports are growing at a fairly rapid rate. For example, imports of lumber, plywood and other non-paper products grew from RD\$16.3 million in 1977 to some RD\$22.7 million in 1981. This is a nine percent annual increase. Unit costs of imported forest products have also increased substantially over the past few years.

From the above one can conclude that forest products represent a major and growing drain on the limited foreign exchange available. At the same time, the country has a realistic opportunity to move ahead in terms of developing domestic production of needed wood

products that can substitute for imports. Such development will be a central focus of the Forestry Management Project.

In order to provide some perspective on what would be involved in total import substitution of solid wood and composition board products, the following figures are pertinent:

- 1) Total 1981 imports:
 - RD\$22 million;
 - 75,000 tons or approx. 105,000 M³/yr;
- 2) Roundwood volume needed to provide 105,000 M³ output depends on conversion efficiency. Assume here that on average one needs 1.3 M³ roundwood to produce 1 M³ processed product. Thus, 136,000 M³ (r) are needed per year.
- 3) Harvest area needed for 136,000 M³(r):
 - At 10 M³/ha yield = 13,650 ha;
 - At 20 " " " = 6,800 ha;
 - At 30 " " " = 4,550 ha;
 - At 40 " " " = 3,412 ha.
- 4) In terms of sustained yield plantations with 20 yr. rotation and pine growing at 7.5 M³/ha/yr., the DR would need 910 ha x 20 = 18,200 ha. On poorer sites with 3.75 M³/ha/yr or longer rotations, some 36,000 ha would be needed on a sustained yield basis.

Available information on forest area and wood availability (see Annex I-8) make it evident that the Dominican Republic could conceivably become totally self reliant in terms of non-paper wood-based products during the 20 year economic life of the project. (While the country might wish eventually to explore possibilities for domestic pulp and paper production, this should not be a consideration at the present time nor during the life of the project. The market and the resources do not exist to support a mill anywhere near the minimum economic size needed.) Eventually, it could become a net exporter.

b. Employment Generation

Given the high level of chronic unemployment and underemployment in the country -- 20 to 50 percent depending upon how one

measures it -- employment generation is a critical element in any development project. The project employment objective can be tied closely to the import substitution objective. For example, at 1981 levels of imports, if substitution took place for sawnwood, timber, plywood, and other board product imports (i.e., excluding pulp and paper), the full time unskilled jobs created during the economic life of the project would likely reach 1,000 to 1,500 or more. For example, just looking at the employment in logging and sawmilling, one could conservatively estimate about 850 new jobs (at 160 cubic meters per man-year, a ratio derived empirically from Latin American Forestry Project Evaluation).

6. Conclusions

This economic analysis demonstrates that the Forestry Management Project should be a GODR investment priority of the first order. Financial rates of return for the potential private investor are high, and should stimulate substantial entrepreneurial activity in the forestry sector. Likewise, economic rates of return are high even when considering only on-farm net benefits. Adding the major off-farm benefits of reduced erosion, flooding and sedimentation results in very high economic returns, and leads to the conclusion that the project is an imperative for bringing the economic, social and ecological stability to the mountains of the Dominican Republic. Failure to invest in the project at this critical juncture could set back commercial forestry by a decade or more, and condemn the country to further ecological degradation and economic contraction.

D. Financial Analysis

1. Summary

Analysis of future market demand for wood products and production credit leads to the conclusion that both demands will be very strong during and beyond the life of the project, and will be major driving forces for project implementation. The recurring cost analysis leads to the conclusion that with proper fiscal controls, DGF can become self-financing within 6-10 years after project completion, after which it would be a net revenue producing agency for GODR. On the basis of this analysis, we conclude that the project will be financially very strong and that it should receive support of the highest priority by the GODR.

2. Purpose

The purpose of this analysis is to determine whether there will be sufficient future demand for project wood products and credit funds, and whether DGF will be able to finance post-project recurring costs.

3. Domestic Demand for Forest Products

Demand for forest products is affected by many variables, two of the most influential of which are gross domestic product and population. Estimates for these two variables are made in the following analysis, and then are used to derive demand for forest products over the next twenty years, the economic life of the Forestry Management Project.

To calculate the expected gross domestic product, estimates from a Brookings Institution study were used. This study estimates that the gross domestic product (GDP) of Latin American economies will fall 7 percent within the next five years, and that within the following five years, GDP will decline 10 percent.

Beginning in 1993, the Dominican Catholic University has estimated that the GDP will experience a positive annual growth rate of about 4.6 percent. The reasons for the expectation of such slow growth are the lack of GODR ability to borrow additional funds, and the limited capacity to repay existing debts.

Given these assumptions, the consumption of wood products will decline from approximately 147,800 cubic meters consumed in 1983 (according to Central Bank data) to 134,400 cubic meters in 1993. Afterwards, increasing consumption of wood products is expected to take place at a rate closely related to the growth of GDP, reaching about 2.1 million cubic meters in 2003.

Population growth is also an important variable in explaining the changes in wood products demand, especially for those products used to generate energy (firewood and charcoal) and those used in construction (lumber). A positive relation exists between population growth and consumption of these products.

Assuming a conservative growth rate of 2.5 percent, the Dominican Republic will be inhabited by 10.4 million people in 2006, while based on the 1970-80 growth rate of about 2.8 percent, in 2006 the population will be 11.2 million. That means that by 2006 wood consumption will reach about 0.28-0.3 million cubic meters.

Although scarcity of reliable statistics specifically for consumption of firewood and charcoal make projection difficult, the most recent study by the Banco Central and FEF in 1979 placed annual charcoal consumption at 10 million sacks of 35 kgs. Using a conversion factor of four tons of green wood per ton of charcoal, this required 2.9 million cubic meters of wood.

In 1981 the apparent consumption of firewood was 686,000 tons of petroleum equivalent, with an additional 154,000 tons of petroleum equivalent in charcoal consumption. Demand is expected to increase substantially in the coming years as charcoal and firewood are

the major energy and fuel sources for a large percentage of the population, especially the lower income sectors. Shortage of foreign exchange for petroleum imports will add to this demand, thus providing additional incentives for efficient and rational use of the Dominican forest.

By 1990, estimated demand for firewood is placed at 3.6 million cubic meters. Using this per capita consumption of .51 cubic meters per person, this means that a supply of 5.7 million cubic meters of firewood will be necessary for the year 2000.

Thus, future domestic consumption estimates vary widely, depending on whether GDP or population predictors are used. However, as the annual production for Sierra de Bahoruco and Sabana de San Juan are not expected to exceed 0.15-0.2 million cubic meters in 2003, the total domestic demand of 7.9-9.7 million cubic meters far exceeds project production capabilities.

This domestic demand analysis indicates that there will be a strong market for wood products during and well beyond the economic life-of-project.

4. Demand for Credit

Credit demand analysis is based on the production activities foreseen under the Forestry Management project in the Sierra de Bahoruco and Sabana de San Juan areas. Yields and production of these areas was estimated under an assumption of relatively efficient management. The following are representative calculations which illustrate how the \$5 million credit fund could be disbursed under Forestry Management Project (see Table 6).

TABLE 6

Practices	Area to be Financed	Cost RD\$/Ha.	Disbursement (RD\$)
Fuelwood Production	3,000	981	2,551,170
Wood Production (poles)	2,500	685	1,480,397
Wood Production (lumber)	<u>2,000</u>	649	<u>1,167,675</u>
Total	7,500 <u>a/</u> 9,000 <u>b/</u>		5,189,242

a/ 90% Financing
b/ 75% Financing

Another option for the credit fund would be pine plantations. Using a 2,600 hectares model, about \$2.2 million could be absorbed by year 13 (see Table 7). Through year 5 about \$0.72 million would be needed on 1,500 hectares. The full \$5 million fund thus could cover about 10,440 hectares.

TABLE 7

Public Loan (Credit) Outlays and Receipts
(2,600 Ha.)

Year	New Hectares Added to Program (Ha.)	Cumulative Hectares Included (Ha.)	Loan (Outlay) or Receipt (RD\$ 000)	Cumulative Loan (Outlay) or Receipt (RD\$ 000)
1	100	100	(31.2)	(31.2)
2	200	300	(74.4)	(105.6)
3	300	600	(129.6)	235.2)
4	400	1,000	(196.8)	432.0)
5	500	1,500	(286)	(718.0)
6	"	2,000	(322)	1,040.0)
7	600	2,600	(395.2)	(1,435.2)
8	-	-	(252)	(1,687.2)
9	-	-	(206)	(1,893.2)
10	-	-	(154)	(2,047.2)
11	-	-	(90)	(2,137.2)
12	-	-	(56)	(2,193.2)
13	-	-	(16)	(2,209.2)
14	-	-	(14)	(2,195.2)
15	-	-	(60)	(2,135.2)
16	-	-	-	"
17	-	-	-	"
18	-	-	-	"
19	-	-	-	"
20	-	2,600	-	"
21	-	2,500	302	(1,833.2)
22	-	2,300	604	(1,229.2)
23	-	2,000	906	(323.2)
24	-	1,600	1,208	884.8
25	-	"	1,510	2,394.8
26	-	600	"	3,904.8
27	-	-	1,812	5,716.8

Source: Gregersen, Economic Analysis of Forestry Management project.

This credit demand analysis indicates that about 9,000-10,440 hectares of forest production can be financed with the \$5 million credit fund over the five year life of the project. We judge this to be well within DGF's projected capabilities, and implies that credit demand will be more than sufficient to justify a \$5 million credit fund.

5. Funding for the Dirección General Forestal
After the Project's Termination

a. Current Financial Situation

The financial resources of the Dirección General Forestal (DGF) come from the general funds provided for it in the national budget, the income generated by taxes and permits for the removal, transport and commercialization of charcoal and other forestry products, and from occasional entries due to the sale of small quantities of confiscated wood.

DGF's total operating budget for 1984 is RD\$5,175,000, of which RD\$3,376,840 are destined to cover personnel services. This includes salary payments for full-time and temporary labor. This quantity represents 66 percent of the total budget for this year. By May 1, 1984, DGF had received some RD\$1,307,881.35 from the Central Government to cover its operating costs, which represents in turn 76 percent of the amount DGF was programmed to receive during that period. Of this percentage, only 9 percent goes to capital forming activities, while the rest is spent on per diem, office supplies, gasoline and indemnization payments to owners of saw mills closed by DGF.

The income obtained through taxes on transport and marketing of charcoal are relatively small. The income from forestry taxes registered last year for the chopping and transport of trees was RD\$144,904.63. According to reports from the Administrative Division of DGF for the period of January-April of this year, the income collected through issuing about 4,000 permits to transport wood and charcoal was RD\$185,036.32. Of this total, approximately 45 percent reaches DGF, since the greater part of these funds are received by the Internal Revenue Directorate and go directly to the Finance Department and not to the Forestry Fund.

b. Post-Project Funding

Once the implementation stage of the project is finished, DGF will require adequate financial resources to continue the operations initiated under the project. The alternative sources of funding which would permit it to carry out its objectives include the following:

1) National Budget

The resources that come from the National Budget constitute the bulk of DGF's income.

DGF must try to obtain a budget allocation which approximates to a greater degree the funds requested for its program needs. In the last 4 years the GODR has been allocated approximately 67 percent of the total requested.

2) Direct Taxes on Production, Transport and Commercialization of Charcoal

The taxes established on the concession of permits required for the transport and commercialization of charcoal constitutes the second source of funds for DGF. Currently, DGF receives RD\$0.05 per sack full of charcoal registered. However, approximately 50 percent of the total volume produced is not registered which results in a proportionate loss of tax revenues.

Assuming that the total volume of charcoal produced is equal to the volume consumed and given that for 1979, the national production of charcoal was around 900,000 sacks per month, one can estimate that the yearly per capita consumption was 2 sacks of charcoal. Using trend population projections the annual revenues from taxes that DGF will receive during the 1985-2000 period will increase from RD\$310,000 to RD\$460,000.

3) Taxes on the Importation of Wood

Law 211 of October 31, 1967 established in its article 1, a tax on imported wood, according to its type and quality, expressed in Pesos per cubic meter. In 1983, when the Country Environmental Profile team estimated that around 200,000 cubic meters would be imported, the revenues forthcoming from this source amounted to RD\$4.7 million. As was noted previously, these taxes go directly to the government's Department of Finance with little benefit to DGF. The authorities in the Dirección General Forestal should be allocated a greater percentage of these resources. For example, a 45 percent allocation could mean an average yearly revenue of at least RD\$2.1 million annual average during the next 15 years.

4) Commercial Exploitation Permits

As a result of this project, the controlled exploitation of relatively small forestry areas will serve as another source of economic resources for DGF.

Under The Forestry Management Project, the DGF will let for bidding among private firms the controlled exploitation of

forests in Sierra de Bahoruco and Sabana de San Juan. This will be carried out under direct supervision of DGF. The terms of the leasing arrangements of these tracts of land will include the establishment of taxes (stumpage fees) measured in RD\$/M³ on the cutting of timber, in addition to the payments made for the usufruct rights to the forest.

In 1982, DGF's technicians estimated that the execution of the Manabao model plan of forestry management, in which it recommended the careful exploitation of 2,700 hectares of public land for the project's first 3 years, could represent a potential income of RD\$3.9 million.

On the basis of the Manabao experience, DGF estimates that exploitation of the Sierra de Bahoruco and Sabana de San Juan areas will yield RD\$1.921 million in revenue by project-year 5 and by RD\$14.481 million within 20 years (see Table 8 below). The net revenue to the nation as a result of this project reaches RD\$1.835 million by project-year 6, after accounting for projected recurrent costs, and RD\$11.335 million annually after 17 years.

c. Conclusions About Recurring Costs

The above analysis indicates that there are two significant sources of funding (stumpage fees and taxes) which produce revenue for DGF recurring costs. Project activities will increase revenues from stumpage fees and taxes, and it is these sources which increasingly should be used by the GODR to finance DGF activities. Hence, during the life of the project, DGF could begin to self-finance its current operating budget. Because timber yields and therefore stumpage fees will increase, under management, by 20 percent annually after project funding ceases, DGF could become completely self-financing within about 6-10 years. After this it would be a net revenue generating agency for the GODR. If so DGF, like the U.S. Forest Service, would be the only net revenue producer in the government. As a net revenue producer with well defined capital investment possibilities, the DGF ought to have reasonable assurance of sufficient funds to meet operating costs and prudent capital investment needs. The fiscal integrity of DGF can be bolstered significantly by a condition precedent to this project which places revenues in the Forestry Fund under DGF control in accordance with Law 5856.

TABLE 8
 Recurrent Cost Analysis
 DGF Income and Expenses Resulting from Forest Management Project

	Y e a r										
	1	2	3	4	5	6	7	8	9	10-16	17-20
	(\$ 000)										
<u>Income</u>											
- Stumpage Fees	-	99	198	396	1,833	3,166	4,500	4,500	4,500	4,500	14,130
- Taxes	-	5	10	20	88	152	216	216	216	216	351
- AID Loan	1,277	1,280	995	593	552	-	-	-	-	-	-
- AID Grant	384	576	366	204	162	-	-	-	-	-	-
Total	1,661	1,960	1,569	1,213	2,635	3,318	4,716	4,716	4,716	4,716	14,481
<u>Expenses</u>											
- Operating Costs	323	439	286	305	235	317	317	317	317	317	634
- Tech. Assistance	384	576	366	204	162	-	-	-	-	-	-
- Commodities	1,178	942	574	278	181	630	630	630	630	630	1,260
- Training	416	616	311	141	156	50	50	50	50	50	50
- Infrastructure	50	214	164	154	153	40	40	40	40	40	80
- Services	252	253	53	53	53	100	100	100	100	100	200
- Personnel	306	546	485	395	346	346	670	670	670	724	922
Total	2,909	3,586	2,239	1,530	1,286	1,483	1,807	1,807	1,807	1,861	3,146
Net Income (Loss)	(1,248)	(1,626)	(670)	(317)	1,349	1,835	2,909	2,909	2,909	2,855	11,335

Source: USAID and DGF; see accompanying footnotes

Footnotes for Recurrent Costs Analysis:

- * Fees were obtained by assuming stumpage sales of volumes composed of 28 % firewood at \$3.30/cubic meter; 32% of poles and post at \$15/cubic meter and 40% sawtimber of \$69/cubic meter. Sales between year 2 to 6 averaged 32,200 cubic meters per year. Sales between year 7 to 16 averaged 135,000 cubic meters per year and sales from year 17-20 averaged 270,000 cubic meters per year. In this last period, the volume composition will change to 4% firewood, 26% poles and posts and 70% sawtimber.
- ** Taxes were derived only for the assumed stumpage sales as follows: Reforestation Tax (Law 5856, 1962) \$5.00 per 1000 board feet; calculated from 200 board feet per cubic meter of pine sawtimber; b) transport tax for poles and posts of \$2 per cubic meter; and c) charcoal transport tax at \$0.50/sack (each cubic meter of firewood produces 4 sacks of charcoal) this means \$2.00/cubic meter of firewood.
- *** Project income was assumed as the combination of AID's inputs and revenues (stumpage fees and taxes) as a result of project's field activities in Sierra de Bahoruco and Sabana de San Juan pine forests.
- **** Project expenses represents all AID's and GODR's Inputs required for implementation of activities. Beyond year 5 it is assumed that GODR will increase the level of expenditure by 10% above the average of years 3 to 5.
- ***** The Net Income represents the level of financial benefits for the GODR for the life of the project and beyond.

E. Social Soundness Analysis

1. Context and Focus for Analysis

The Social Soundness Analysis for the Forestry Management Project is complicated by several factors relating to the practice of forestry in general in the Dominican Republic. Principal among these is the lack of a data base to examine and from which to operate, due to the nearly twenty years hiatus in the practice of production forestry in the D.R. Second, those private people who are presently involved in forestry, with the exception of Plan Sierra beneficiaries, are operating at the margin, either socially or legally. This group includes firewood cutters and gleaners, charcoal makers, and illegal lumbermen. Finally, there are a considerable number of variables that may affect seriously the success of forestry development in the Dominican Republic when one considers the planning time horizon, which can be up to 40 years in some

plantation pine areas; and the relative volatility and mobility of groups of rural people in this country. Therefore, this analysis concentrates principally on the two forestry development zones identified as pilot areas, Sierra de Bahoruco and Sabana de San Juan, and emphasizes the experimental nature of project activities as they relate to the rural poor population.

2. Issues Relating to Project Activities

a. Land Tenure

In both Sierra de Bahoruco and Sabana de San Juan, several types of possible conflict over land tenure exist. Serious encroachment on DGF lands by local small farmers and charcoal makers indicates that these groups must be accommodated by the project in some manner to avoid their further impoverishment, and potential protest. Insecurity of tenure is likely to be an inhibiting factor to investment in forestry production which requires long-term management of land and frequently a transition period from an agricultural system to an agroforestry or forestry system. Again, this relates more directly to small farmers in the areas than to large holders with relatively secure tenure and other sources of income. A notable exception to this tenure-related insecurity is farmers who are members of agrarian reform settlements in the Sierra de Bahoruco area, who are guaranteed usufruct rights for life.

b. Public Sector Versus Private Sector

It is desirable to involve the private sector to the maximum degree possible, consonant with sound forest management practices. This conclusion results from experience in other countries, as well as considerations relating specifically to present conditions in the Dominican Republic.

Generally, when forestry agencies attempt to treat problems of deforestation and environmental degradation as problems of control of the actions of small farmers and wood gleaners, the net social benefits tend to be low. Forest service patrolling becomes increasingly difficult and expensive, with ever greater friction between the forest guards and the encroaching parties, who usually have increasing economic incentives to continue their wood cutting either for fuel or for crop land. Presently, DGF and the Dominican Republic are locked into this mode of control, and as elsewhere, the likelihood of corruption, conflict, and genuine misunderstanding regarding law enforcement will escalate unless the rural poor participate and benefit from profitable forest practices.

There are significant opportunities available to DGF and the Dominican Republic. Interest in forestry development within the private sector is high, especially in universities, private volunteer

organizations, and among large investors. Further, the present DGF system of forestry patrolling uses vigilantes who are hired by DGF from local communities. From interviews with vigilantes and community members, it appears that most of these guards have good relationships with the communities in which they work and with those who are current or potential offenders; frequently this results from a realistic, tempered approach to the enforcement of the cutting ban and other regulations as well as social pressure.

DGF can improve its image among the majority of Dominicans, by emphasizing functions apart from enforcement, particularly assisting with management plans, helping with fire control, conducting research and extension, and, in the future, community forest improvement. This will, over time, help the agency to carry out its enforcement activities as well. DGF's emphasis on private sector support and monitoring, and its remaining out of the "lumber business" itself, will enhance its ability to perform legitimate public sector tasks.

c. Beneficiaries and Participation

Beneficiaries of the Forestry Management Project will be of three types, but the largest group by far will be AID's traditional target population, the poor rural majority. Employees of DGF, from professionals receiving M.S. degrees to vigilantes who are trained in fire control and protection, will obviously benefit from enhanced skills and knowledge through greater job satisfaction and competence and subsequent higher income. Private companies and individuals who stand to profit by the increased production of timber, either through processing, marketing or harvesting, represent a second group of beneficiaries, which will include the rural poor mostly through community groups or cooperatives. For the final group, AID's standard clientele, benefits will accrue chiefly through increased forestry employment, legal access to better quality fuel wood to make charcoal for sale, and increased employment in jobs using wood products, such as carpentry and construction.

In order to maximize the benefits for this last group, DGF and AID expatriate technical assistance will make special efforts to increase their level of participation. As this group of small farmers, landless laborers and charcoal makers is now present in the forestry development zones, especially the Sabana de San Juan, their knowledge of local conditions will be useful for planning and their collaboration essential for plan implementation. In many cases, including agrarian reform settlements, considerable potential exists for community-based forestry to produce timber and fuel. Extension agents and vigilantes need to seek methods to involve the local population and be responsive to their needs and suggestions. Studies from numerous countries indicate that the greater participation of the poorest local residents, who are those most likely to need to encroach on public forest

lands, the greater the productivity and social benefit of the forestry project.

3. Social Strategy for Project Implementation

Recognizing the limited experience of the Dominican Republic, and especially DGF, with community and social forestry, forestry extension services, and multiple use and agroforestry systems, the project will carry out considerable social analysis as part of field activities and in the development of an extension strategy and extension materials. Although the focus of production activities under the project will be timberland, principally pine forest, the communities and privately owned lands within the forestry development zones will also give DGF a pilot area to introduce new forestry systems based upon local social and ecological conditions.

a. Management Plan Development

Development of the management plans for the national forests will include extensive analysis of the social milieu of the public land under DGF management, as well as of the nearby communities and private holdings, so that management plans realistically reflect these during implementation. The management plan will include a mechanism to quickly and justly settle land tenure disputes which may arise between local residents and the state and between residents. Often under the present system, using the National Land Tribunal, these conflicting claims can take five to ten years to settle.

A local survey of labor availability and employment will be carried out so that DGF and outside forest contractors hired to exploit timber will have ready knowledge of possible local employees or subcontractors. A profile of local organizations, such as farmers' associations, will be completed for future extension and fire control activities and, to the maximum degree possible, for input to the management plans for public forest land.

b. Social Forestry In Conjunction With Technical Forestry

Social forestry and community-based programs will be initiated by DGF to support and implement its present technical forestry activities and as pilots for incorporation in future efforts. This will take several forms. First, in the forestry development zones, DGF extensionists and vigilantes will take the initiative to promote community efforts in fire control and forest protection, reforestation, and, where appropriate, community efforts in wood production, processing and marketing, including agroforestry applications. Second, the curricula of the National Forestry School of Jarabacoa for two-year technicians (peritos) and vigilantes will include community relations and mobilizations, principles of social forestry and agroforestry, and

assistance to groups of small landowners in the preparation of management plans. Last, community groups will be encouraged to participate in the Forestry Management Project activities directed toward private sector development, and to seek contracts for services to DGF within the public forest lands under management.

c. Maximize Private Sector Participation

The project envisions support of private entrepreneurs in the two forestry development zones for exploitation services within the DGF forest lands and for production forestry ventures within the zones on private lands. In addition to the efforts mentioned above to include local individuals and groups as active participants, the institutional strengthening component will establish strong linkages with private Dominican organizations, which are developing capacities in forestry. Two universities are presently offering courses related to forestry, though not a full curriculum, and are beginning forestry research. The Instituto Superior de Agricultura has a significant research fuelwood program underway funded by AID under the Energy Conservation and Resources Development project with technical assistance from Purdue University. A number of PVOs, both Dominican and international, have embryonic programs directed toward community reforestation efforts and social forestry. These will be given support by DGF, as is the case with CARE now, in the development of their programs and technical capacity.

As DGF develops its expertise in extension and promotion, and as local universities and PVOs gain experience in both the technical and social aspects of forestry systems in the D.R., closer collaboration will be sought through joint projects, seminars and training.

V. PROJECT IMPLEMENTATION

A. GODR Project Administration

The project will be managed and administered within the existing GODR institutional structures. The DGF will have the overall responsibility for managing the project and will be assisted at the DGF Director level by a long-term advisor from the U.S. Forest Service. Within DGF, the Division of Programming and Planning will manage the various project activities through the Project Coordinating Office (PCO), which will have a full-time Project Coordinator appointed at the outset, plus three professionals and a contracted technical advisor.

All plans to carry out project activities and all project disbursement requests will require prior approval by the PCO. This will assure that adequate technical standards are maintained in all project documentation, and will provide a better coordination among the different project implementing divisions of the DGF.

To implement the Credit component, the STP will authorize funds for the account of DGF. Then, DGF will issue checks to Banco Agrícola. The DGF will process disbursement requests from the BAGRICOLA for the credit fund operation. Local BAGRICOLA branches in the project area will process local credit fund requests based on documentation and work plans approved by the Field Operation Coordinating Office (FOCO) in each selected project area. This will be done in accordance with a project procedures manual.

In addition to credit requests, the FOCO will review disbursement requests made by DGF's field implementation units, will certify that the proposed disbursement is consistent with field level workplans, and will forward it to the PCO for certification. Upon approval by the PCO, disbursement will be made to the requesting unit, through the DGF Administrative Division, in accordance with the Project procedures manual.

The Division of Programming and Planning, through the PCO, will act as the administrative office for coordinating documentation between AID and the DGF implementing unit. This Division will prepare all project quarterly and annual financial reports, disbursement requests, borrower/grantee correspondence, and other project documents required by GODR and AID.

The Division of Planning and Programming assisted by AID contractors, will be responsible for the administration of the training package. For the selection of candidates, a procedure will be established very similar in principle to the one used in NARMA, especially for overseas training. Criteria for selection of candidates will be established jointly with AID, and a joint committee will review and recommend candidates to the Project Director who, upon approval, will

request USAID processing of the candidates. For training at the National Forestry School in Jarabacoa, candidates will be selected according to similar prerequisites established for long-term trainees.

B. AID Project Administration

1. Implementation Monitoring

The Mission believes that due to the multidisciplinary nature of the project it will be necessary to utilize the skills of many staff members as a Project Committee to effectively monitor and support the project. The Mission's Agricultural and Rural Development Office (ARDO) will have primary responsibility for monitoring the project. Through a USDA/PASA with the Forest Service, a long-term forest service administration specialist will be contracted as the Project advisor. One long-term research specialist will be hired on a personal services contract and the remainder of the technical assistance will be procured through a Title XII university. They will be assigned to work within DGF to assist in all aspects of project implementation, to coordinate the Mission's monitoring activities and to assist AID at the working level. USAID monitoring responsibilities will be assigned to one member of the ARDO, who will be designated as USAID project officer. Members of the other Mission offices will be designated as project team members. In particular, personnel from the Controller, Management, and Capital Development/Engineering offices will be assigned to the team to provide regular staff support for the project. Additional members from the ARDO staff will supplement the project team from time to time to assist in carrying out field monitoring.

In addition, it is expected that DGF will coordinate with U.S. Peace Corps to incorporate eight volunteers in the implementation of project activities, such as research, extension, and training of forestry technicians. Two volunteers will work in Jarabacoa to help train vigilantes and peritos. Four volunteers will be assigned to the project zones to help develop extension capacity. Two others will be assigned to the field level applied research stations.

2. Disbursement Procedures and Reporting Requirements

AID funded U.S. loan dollar costs under this project will be primarily for training and equipment, and grant costs will be for technical assistance. Loan and grant dollar disbursements under the project will be made using standard AID procedures, including direct payment, direct reimbursement or by issuing Letters of Commitment, and making payments through the use of Letters of Credit.

AID funded loan peso costs will finance primarily infrastructure development technical (survey) services, locally procured materials and critical operating costs such as vehicle maintenance and fuel. Disbursements will be made monthly based upon the estimated

requirements of the project for a period of 90 days. Disbursements will be made on the basis of reports submitted by the DGF presenting the status of the funds previously disbursed and specifying the needs for the ensuing 90 day period. Disbursement of operational costs will be under the direct control of the Director of DGF.

If PL-480 peso funds are used under this project, disbursements will be made annually on the basis of annual budgets and reports submitted by DGF presenting the status of the funds previously disbursed and specifying the needs for the ensuing one year period. This is in accordance with existing PL-480 guidelines established by the USAID and GODR.

The above described reporting procedure will provide USAID with the information necessary to determine program requirements. Upon receipt of evidence that counterpart funds have been deposited in the GODR special account, USAID will disburse for the next quarter's requirements. The advance checks will be forwarded directly to the GODR Secretariat of Finance for immediate release to the DGF.

C. Financial Plan

1. The Budget

The total cost of this five-year project is estimated to be \$19.4 million. AID will provide \$6 million in loan funding and \$2 million in grant funding. The GODR counterpart will total RD\$11.4 million.

a. AID

AID resources will total \$6 million in Loan funds and \$2 million in Grant funds. A total of \$1,108,000 will be reserved to cover inflation and contingencies. AID resources will be used to finance the following:

- 1) Technical Assistance (\$1,728,000 in Grant funds). A long-term, resident project advisor will be provided for the life of the project at a total cost of \$600,000 to act as the principal liaison between AID and DGF and to coordinate project activities. A long-term, resident technical forester will be provided for 24 months at a cost totalling \$240,000 to direct the DGF Project Coordinating Office during the establishment of this office and to train the Dominican counterpart who will succeed him/her at the end of two years. A second long-term, resident specialist forester will be provided for 24 months at a total cost of \$240,000 to establish applied research programs in each forestry development zone and to develop an applied research plan for DGF nationwide. A long-term, resident specialist in forestry extension will be provided for 24 months at a cost of \$240,000 to develop and field test extension materials and techniques in the forestry development zones and

to incorporate extension, community liaison, and social forestry in the curricula at the Escuela Nacional Forestal at Jarabacoa.

Short-term technical assistance, one to 2 months, totalling 20 months at a total cost of \$240,000, will be provided to perform the following: review and revise curricula for forest technicians (peritos) and vigilantes; develop fire control manuals, course materials, and campaign materials; train forest inventory and land demarcation teams; develop two forest management plans and guidelines for review of private sector management plans; assist in the initial phases of implementation of management plans in the two national forest areas; complete analyses of Dominican wood products markets and develop methods for promotion of potential Dominican wood products; and help establish the procedures and initial operation of the private sector credit fund. One medium-term advisor will be provided for 6 months at a total cost of \$60,000 to supervise the development of the initial forest management plan. A social analyst/social forestry advisor will be provided for 6 months at the beginning of the project to help design implementation plans and extension strategies for the forestry development zones. To monitor plan implementation during the project, this same social analyst/social forestry advisor will be provided for 2 two-month periods.

2) Commodities (\$3,098,000 in Loan funds). This project will provide for the purchase of commodities for field operations and central office support. Radio communication equipment totalling \$100,000 will be provided to establish a nationwide fire control network and for operations within the forestry development zones. Micro-computers and software for \$50,000 will be purchased for field forest inventory and central office accounting and administration.

To establish two sub-district offices and upgrade central office facilities, \$100,000 in office equipment, furniture and materials and \$50,000 in general forestry equipment will be provided. Construction materials totalling \$64,000 will be provided for minor refurbishing of central offices. In order to enhance the DGF's fire control and protection capability, \$117,000 of fire control equipment (principally tools) and \$30,000 of water supply equipment will be procured. Irrigation equipment totalling \$63,000 will be provided to establish new nurseries and expand old ones in the forestry development zones. To develop DGF's capacity to map, inventory, and monitor forests under its stewardship, cartographic equipment totalling \$50,000 and drafting equipment totalling \$20,000 will be provided. Demarcation of the national forests in the project requires the purchase of surveying equipment totalling \$25,000.

Research equipment and supplies totalling \$60,000 will be provided to initiate applied research in the forestry development zones. To establish extension activities within the project area and within the central office, audio-visual equipment totalling \$125,000 and extension materials totalling \$55,000 will be purchased.

To implement the forest management plans within the national forest areas, the following heavy equipment will be provided: two bulldozers (\$250,000), two graders (\$160,000), two tractors (\$50,000) and two dump trucks (\$50,000). In addition, 16 pickup trucks totalling \$240,000 and 10 four-wheel drive vehicles totalling \$150,000 will be purchased for management plan implementation, applied research activities, surveying, demarcation, inventory, and credit fund support. Extension activities will require the purchase of 25 motorcycles totalling \$25,000. To support vehicle maintenance by DGF, vehicle spare parts totalling \$469,000 will be provided. An additional \$795,000 has been reserved to secure the services of a procurement agent and to cover transportation costs.

3) Training (\$870,000 in Loan funds). Five types of training will be funded under the project. Five Dominicans will be trained at the Master of Science level in the United States at a total cost of \$200,000. Fifteen students will receive Bachelor of Science level training in a third country, such as Venezuela or Costa Rica, at a cost of \$375,000. Three-year technical training for ten Dominicans will be provided in Honduras at a cost of \$135,000. Sixty Dominicans will be provided two-year technical training at the Jarabacoa facility and AID will finance \$100,000 of the costs of training materials. AID will also provide \$60,000 for training materials for 240 vigilantes to be trained in-country.

4) Infrastructure (\$85,000 in Loan funds). Funding will be provided for the building of ten fire towers, ten water cisterns, several small base camps, nurseries and applied research stations in the national forest areas. AID funding for these activities will total \$285,000.

5) Technical Services (\$150,000 in Loan funds). Funding will be provided to procure local technical services in the critical areas of market analysis and land demarcation totalling \$150,000.

6) Operating Costs (\$689,000 in Loan funds). To ascertain the continued smooth functioning of project field activities throughout the life of the project, AID will provide \$689,000 for DGF operating costs, principally for vehicle operation and critical supplies.

7) Evaluation (\$72,000 in Grant funds). Two evaluations will be performed during the project, as well as an end-of-project evaluation. AID will provide \$72,000 to fund these three evaluations by non-AID personnel.

b. GODR

Counterpart resources for the Forestry Management project will total RD\$11.4 million, including inflation and contingency of RD\$845,000.

1) Training (RD\$770,000). Counterpart funding for training will total RD\$770,000. Training for 60 two-year technicians at the National Forestry School at Jarabacoa will be provided at a GODR cost of RD\$500,000. For training of 240 vigilantes in community relations, social forestry and extension at Jarabacoa, GODR will provide RD\$240,000. Short courses for 200 farmers in the forestry development zones will be provided by GODR counterpart of RD\$30,000.

2) Commodities (RD\$846,000). GODR will provide office equipment for the DGF central office totalling RD\$51,000. Tools and marking materials for forest demarcation and management plan implementation will be purchased by GODR at a total cost of RD\$285,000. Remodeling of DGF central office will be financed by GODR counterpart totalling RD\$510,000 for construction materials.

3) Salaries (RD\$2,078,000). Salaries of DGF personnel working directly on project activities will be provided by the GODR at a total cost of RD\$2,078,000 for the life of the project.

4) Operating Costs (RD\$897,000). DGF costs for rental of buildings and for utilities will be provided by GODR and total RD\$187,000. In-country travel for DGF personnel will cost RD\$165,000 and be provided by counterpart funds. GODR will provide operating costs of DGF vehicles totalling RD\$266,000. General supplies for DGF offices and field operations will total RD\$279,000 and be provided by counterpart funds.

5) Infrastructure (RD\$450,000). To establish forestry base camps, research stations, water storage cisterns and fire control towers, RD\$250,000 will be provided.

6) Technical Services (RD\$514,000). Funding will be provided to procure local technical services in market analysis and land demarcation totalling RD\$314,000. Part of these funds will also be used for GODR support of planning, monitoring and evaluation workshops.

7) Credit (RD\$5,000,000). GODR counterpart will provide for the establishment of a credit fund specifically reserved for forestry development activities in the forestry development zones. This fund will be administered by the Banco Agrícola and total RD\$5 million.

TABLE 9
INPUTS BY ACTIVITY

Project Activity	Source of Funds					
	AID			Total		Total
	Loan-FX	Loan-LC	Grant	AID	GODR	
----- (\$ 000) -----						
1. Technical Activities -						
<u>Public Forest Management</u>						
a. Comprehensive Inventory	50	-	-	50	70	120
b. Management Plan Development	135	45	84	264	270	534
c. Public Forest Land Demarcation	70	40	36	146	640	786
d. Subdistrict Office Support	100	82	-	182	174	356
e. Management Plan Implementation	1,063	218	108	1,389	1,756	3,145
f. Fire Control	335	220	36	591	190	781
g. Forestry Research	114	44	240	398	336	734
Subtotal - TA - PFM	1,867	649	504	3,020	3,436	6,456
2. Private Sector Forestry Development						
a. Extension	232	115	240	587	157	744
b. Market Analysis and Development	75	75	60	210	174	384
c. Credit Fund	45	15	24	84	5,015	5,099
Subtotal PSFD	352	205	324	881	5,346	6,227
3. Strengthening of DGF						
a. Organization and Management	-	-	900	900	400	1,300
b. Personnel and Training	870	-	-	870	770	1,640
c. Facilities and Equipment	171	183	-	354	603	957
Subtotal S, DGF	1,041	183	900	2,124	1,773	3,897
4. Evaluation						
	-	-	72	72	-	72
Subtotal Activities	3,260	1,037	1,800	6,097	10,555	16,652
Procurement Agent and Transportation	795	-	-	795	-	795
Contingency and Inflation	645	263	200	1,108	845	1,953
TOTAL	4,700	1,300	2,000	8,000	11,400	19,400

TABLE 10

INPUTS BY LINE ITEM WITHIN COMPONENTS

Component/Input	Source of Funds					
	AID			Total	GODR	Total
	Loan-FX	Loan-LC	Grant	AID		
(\$ 000)						
1. <u>Technical Activities-</u>						
 <u>Public Forest Management</u>						
- Technical Assistance	-	-	504	504	-	504
- Personnel	-	-	-	-	1,534	1,534
- Vehicles Parts	407	-	-	407	-	407
- Heavy Equipment/Parts	768	-	-	768	-	768
- Equipment and Materials	437	120	-	557	285	842
- Operating Costs	-	499	-	499	767	1,266
- Infrastructure	255	30	-	285	450	735
- Services	-	-	-	-	400	400
Subtotal TA-PFM	1,867	649	504	3,020	3,436	6,456
2. <u>Private Sector Development</u>						
- Technical Assistance	-	-	324	324	-	324
- Personnel	-	-	-	-	144	144
- Vehicles/Parts	105	-	-	105	-	105
- Equipment and Materials	172	15	-	187	-	187
- Operating Costs	-	115	-	115	88	203
- Credit Funds	-	-	-	-	5,000	5,000
- Services	75	75	-	150	114	264
Subtotal PSD	352	205	324	881	5,346	6,227
3. <u>Strengthening of DGF</u>						
- Technical Assistance	-	-	900	900	-	900
- Personnel	-	-	-	-	400	400
- Vehicles/Parts	114	-	-	114	-	114
- Equipment and Materials	57	108	-	165	561	726
- Training	870	-	-	870	770	1,640
- Operating Costs	-	75	-	75	42	117
Subtotal S. DGF	1,041	183	900	2,124	1,773	3,897
4. <u>Evaluation</u>						
- Technical Assistance	-	-	72	72	-	72
Subtotal	3,260	1,037	1,800	6,097	10,555	16,652
Procurement Agent and Transportation	795	-	-	795	-	795
Contingency and Inflation	645	263	200	1,108	845	1,953
TOTAL	4,700	1,300	2,000	8,000	11,400	19,400

TABLE 11
SOURCE AND USE OF FUNDS (\$ 000)

Input	AID			Total AID	GODR	Total
	Loan-FX	Loan-LC	Grant			
- Technical Assistance	-	-	1,728	1,728	-	1,724
- Vehicles/Parts	626	-	-	626	-	626
- Heavy Equipment/Parts	768	-	-	768	-	768
- Equipment/Materials	666	243	-	909	846	1,755
- Training	870	-	-	870	770	1,640
- Infrastructure	255	30	-	285	450	735
- Technical Services	75	75	-	150	514	664
- Operating Costs	-	689	-	689	897	1,586
- Personnel	-	-	-	-	2,078	2,078
- Credit	-	-	-	-	5,000	5,000
- Evaluation	-	-	72	72	-	72
Subtotal	3,260	1,037	1,800	6,097	10,555	16,652
- Procurement Agent and Transport.	795	-	-	795	-	795
- Contingency and Inflation	645	263	200	1,108	845	2,353
Total	4,700	1,300	2,000	8,000	11,400	19,400

TABLE 12

Description	Person/ Months	Source	Cost (\$000)
- Forestry Administration Expert	60	USFS or PSC	600
- Forestry Research Specialist	24	PSC	240
- Forestry Extension Specialist	24	Title XII Univ.	240
- Senior Forestry Specialist	24	Title XII Univ.	240
- Social Analyst/Social Forestry Advisor	10	Title XII Univ.	108
- Forestry Management Planner	6	USFS	60
- Fire Control Specialist	3	USFS	36
- Forest Products Market Analyst	5	Title XII Univ.	60
- Extension/Training Specialist	2	Title XII Univ.	24
- Land Demarcation/Cadaster Specialist	3	Title XII Univ.	36
- Credit Specialist/Forest Economist	2	Title XII Univ.	24
- Forester/Field Manager	5	USFS	60
- Project Evaluators	6	Profit firm	72
Total	174		1,800,000

2. Recurrent Costs

Assuming that DGF activities initiated under this project are maintained beyond the terminal date of AID financing at the level reached during project year five, the annual recurrent cost to the DGF (or GODR) would be as follows:

<u>Expense Item</u>	<u>Yearly Cost</u>
- Salaries of DGF personnel	RD\$346,000
- Operating expenditures	317,000
- Capital expenditures replacement	630,000
- Survey and related services	100,000
- Training	50,000
- Infrastructure	40,000
Total	RD\$1,483,000

Since this amount represents only 40-45 percent of the annual revenue which will be generated for the 10 years following the

project by the continued implementation of forest management plans, the USAID believes there is a reasonable expectation that the project can continue. Moreover, because the management of forests will lead to higher sustained timber yields after 16 years, the recurrent cost of the project will decline relative to timber revenue in year 17 and beyond (see the Financial Analysis).

3. Methods of Implementation and Financing

The methods of implementation and financing for the goods and services to be procured with AID funds is shown in the following chart, along with dollar amounts:

<u>Method of Implementation</u>	<u>Method of Financing</u>	<u>Approx. Amt. (US\$ 000)</u>
<u>Technical Assistance</u>		
- PASA	Direct Pay	864
- Direct Contract (PSC)	Direct Pay	240
- Direct Contract (Non-Profit Contractor)	Direct Pay or LOC	624
- Direct Contract (Profit-Making Contractor)	Direct Pay	222
<u>Commodities</u>		
- AID Procurement (Procurement Agent)	Direct L/Com.	3,098
- Host Country Commodities Contract	Direct Reimbursement	944
<u>Training</u>		
- Direct Contract (Non-Profit Contractor)	Direct Pay	200
- S&T/IT Direct Placement	Direct Pay	510
<u>Training Materials</u>		
- PASA	Direct Pay	160
<u>Construction</u>		
	Direct Reimbursement	30
<u>Inflation/Contingency</u>		
		<u>1,108</u>
Total		8,000

The methods of financing shown above are preferred methods of financing under the Administrator's Payment Verification Policy

Statements and represent no deviation from the Mission's general assessment of financing policy and procedures. Therefore, no further justification of the above methods of financing is required.

All contracting for technical services and procurement of imported commodities will be performed directly by AID, primarily because all AID-funded costs are foreign exchange requirements and because the DGF currently has limited capabilities in contracting for these types of foreign exchange requirements.

4. DGF Procurement

Procurement of goods and services by the DGF with AID loan funds will fall in five categories: (a) equipment and small tools; (b) construction materials; (c) office equipment, supplies and sundry materials; (d) infrastructure; and (e) vehicle operating costs.

An average expenditure of \$9,000 per month (over the life of the project, \$530,000) has been budgeted for vehicle operating expenses. This is the major category of local currency expenditure from the loan. It constitutes 54 percent of the total local currency financing. Procurements of vehicle operating supplies are routine transactions and will not require new DGF procedures for accounting and payment verification.

The second and third most important categories of local currency expenditures will be for equipment and construction supplies. Procurement will be done in accordance with standard commercial practices, which involve obtaining price quotations, issuing a purchase order and making payment. These transactions will not require formal bidding procedures because of the small value of the purchases (less than RD\$50,000) and the fact that acquisitions will occur over time rather than in a single transaction. The Administrative Division of DGF will handle these purchases directly and will be responsible for accounting and payment verification. A staff of five persons in the division will document the procurement procedures, delivery of goods and payment.

The fourth category of expenditure (in order of value) will be office equipment and off-the-shelf materials. For these goods, procurement will be made by informal procedures involving price quotations and purchase orders. All transactions will amount to less than RD\$10,000.

Finally, the lowest value procurement will involve construction services. Ten fire towers with water systems will be erected at an estimated cost of RD\$30,000. Contracts will be let to private firms, which will be paid a fixed amount for their services.

D. Implementation Plan

1. Schedule of Major Events

The project is somewhat complex in its mix of management activities and in the criticality of time phasing. Therefore, a five year implementation period is necessary. The proposed schedule for the implementation of the major activities required during project implementation is (see Annex G for a detailed Implementation Schedule):

Illustrative Implementation Schedule

- | | | |
|------------------|---|---|
| a. August 1984 | : | Project approved by USAID. |
| b. August 1984 | : | Project Agreement signed and first Implementation Letter issued. |
| c. October 1984 | : | Project Agreement approved by Dominican Congress. |
| d. November 1984 | : | Initial Conditions Precedent - Loan and Grant - met. |
| e. January 1985 | : | Conditions Precedent for DGF Institutional Strengthening component met. |
| f. February 1985 | : | Forest Service contract executed, resident on board. |
| g. March 1985 | : | Conditions Precedent for Area I DGF Public Forest Management component met. |
| h. April 1985 | : | Conditions Precedent for Area I Private Sector Forestry Support component met. |
| i. April 1985 | : | Title XII University contracted and advisors on board. |
| j. May 1985 | : | Procurement Agent contracted. |
| k. January 1986 | : | Management Plan Area I completed, public bids solicited for partial implementation. |
| l. February 1986 | : | First Project Evaluation completed. |

- m. May 1986 : Conditions Precedent for Area II DGF Public Forest Management component met.
- n. June 1986 : Conditions Precedent for Area II Private Sector Forestry Support component met.
- o. February 1987 : Second Project Evaluation completed.
- p. May 1989 : Final Project Evaluation completed.

2. Procurement and Contracting Plans

a. AID Direct Contracting

The Mission has determined that the procurement of all technical assistance and the services of a private procurement agent to purchase the equipment will be undertaken by AID directly. The Mission bases this determination on the conclusion that use of the host country contracting mode for these procurements would unnecessarily delay project implementation. The DGF does not have experience in AID procurement. In addition, direct contracting by AID would not materially increase expenditure of Mission staff time over what would be required to instruct DGF concerning AID procurement procedures.

Large amounts of technical assistance and training are needed to help the GODR in the planning and organization of project activities. To be effective, much of this training and assistance are needed early during the first year. As identified during project development, the U.S. Forest Service and a Title XII university can best provide this training and assistance.

Contracting with the U.S. Forest Service or a Title XII university would prove to be an unnecessarily difficult task for DGF. The contracting process would require the use of procurement procedures with which DGF is not familiar and much of the documentation and negotiations would need to be in English. Contracting of this assistance would prove difficult for DGF. A procurement of this type can best be handled by AID which has more experience and capability in this type of procurement and can minimize possible procurement delay. DGF's very limited contracting experience would probably not permit DGF to obtain the needed assistance on schedule. Thus, serious delays in project implementation could result.

Adding to the GODR contracting weakness, is the fact that contracting of the technical assistance could give rise to special difficulties in the host country/contractor relationships. The GODR in the past has been reluctant to contract advisors at salary levels that greatly exceed those of their host country counterparts. Contracting of the advisors by AID will minimize such friction by avoiding situations

where GODR officials must make salary payments to advisors, provide customs privileges, etc.

b. Host Country Contracting

The procurement of equipment to support field activities will also be unusually complex and technically oriented. The development of specifications will require input from the project advisors in the field to assure that the equipment meets the particular needs of the pilot site. It is therefore anticipated that the project funded advisors will work with a project funded procurement services agent to prepare a detailed procurement plan along with the necessary specifications.

Relying on the existing DGF contracting facilities to complete such a demanding equipment procurement probably would prove unwise. It is almost certain that DGF will be unable to meet the required procurement schedule. Moreover, the procurement will probably overtax the capabilities of the DGF because of its unfamiliarity with international bidding. Therefore, the Mission will obtain the services of a procurement agent through the Contract Management Office in AID/W.

Except for motorcycles, goods and services procured under the loan and grant will have both their source and origin in countries included in Code 941 of the Geographic Code Book or, for those materials purchased under shelf procurement regulations described in AID Handbook 11, from countries in Code 935.

All other contracting for goods and services financed by AID will be undertaken by the host government in conformance with AID Handbook 11, "Host Country Contracting." These goods and services will have their source and origin in countries included in Code 941 of the AID Geographic Code Book or, for those materials purchased under shelf procurement regulations described in AID Handbook 11, from countries included in Code 935.

The detailed plans and designs for infrastructure construction will be prepared by DGF's engineering department. Actual construction will be carried out by a local contractor selected under a formal bidding process following AID "Host Country Contracting" procedures. Since these contracts are all expected to be below \$100,000, the contracting can be adequately managed by DGF with the assistance of the USAID Project Officer and Committee.

c. Waivers

A source/origin waiver is requested in this document from Code 000 to Code 899 for the purchase with loan funds of 25 125cc motorcycles to be used by the DGF field offices. The motorcycles will cost approximately \$25,000. The small "street-trail" motorcycles are not

manufactured in the United States. Although they are available from suppliers in two of the 941 Code countries, country-wide maintenance and service from those suppliers in the Dominican Republic is considered to be inadequate for purposes of the project. A waiver is therefore requested to Code 899 to allow for adequate maintenance and country-wide service of purchased motorcycles.

E. Evaluation

A series of intensive project evaluations will be undertaken. These evaluations will take place approximately every eighteen months during the life of the project. The first evaluation will take place after 18 months of project execution. The focus of this evaluation will be on the execution of the procurement of inputs, the performance of implementing agents, and the progress made toward obtaining Project outputs. Emphasis will be placed on studying the effectiveness of the various management units to execute the planned project activities.

Also during the first evaluation, a special study will be made of the effectiveness of the credit fund. A survey will be made in the first target area to provide baseline information for use in future surveys. In addition, the first survey will focus on measuring private sector response to the credit program. Private sector awareness of the program, its desire to undertake project forest management activities, and the adequacy of the level of incentives will be examined during this initial survey.

The second evaluation will take place after 36 months of project execution. An input and output level performance review will be made of progress toward achievement of purpose level targets. In the first field area, the first survey will be repeated and expanded to examine production levels, the effectiveness of the management plan and results of project. The impact of project activities on erosion and water quality will also be studied using project and survey generated information. In the second area, a survey will be initiated along the lines of that used in the first evaluation for the first field area.

The effectiveness of the institutional structure to carry out project activities will also be examined during the second evaluation. Attention will be given to identifying obstacles and weaknesses in the institutional framework which require adjustment in order to effectively carry out project activities.

The third and final project evaluation will be undertaken at the end of project execution. Targets at each level of the logical framework will be examined during this evaluation. The survey will be repeated in each field area. Questions regarding the impact of the project on target group income and standard of living will be studied. In addition, evidence of spread effects from project management practices will be examined. A major focus of this evaluation will be an

examination of the effectiveness of the DGF-private sector collaboration developed under the project. Experience gained regarding private sector response, interagency coordination, and cost effectiveness will be studied.

All evaluation will be carried out jointly by AID with the assistance of AID-contracted evaluators, and the GODR. DGF's Department of Planning and Programming will have operational responsibility for managing the evaluation. USAID and the PCO will provide assistance in planning the evaluation and in providing the necessary data. Final preparation and publication of the evaluation documents will be the responsibility of the DGF's Department of Planning and Programming.

F. Conditions Precedent and Covenants

The Project Committee recommends that the following conditions precedent and covenants be included in the Project Agreement:

1. Conditions Precedent to Initial Disbursement

a. An opinion of the legal advisor to the GODR that the agreement has been duly authorized and/or ratified by, and executed on behalf of the GODR and that it constitutes a valid and legally binding obligation of the GODR in accordance with all of its terms;

b. A statement of the name of the person who will represent the GODR and of any additional representatives and a specimen signature of each person specified in such statement;

c. Evidence that a Project Coordination Office (PCO) has been established as part of the Programming and Planning Division at DGF;

d. Evidence that a Project Director and a full-time Coordinator have been appointed within the PCO for the project;

e. A technical assistance plan including the scope of work for the long-term technical assistance to be provided under each particular activity; and

f. Evidence that counterpart personnel for each long-term advisor have been appointed.

2. Conditions Precedent to the Technical Activities to Improve Forest Management

a. An administration manual which describes the procedures to be followed in accounting for project funds and acquiring goods and services for the operation of the technical units;

b. Evidence that the Research Unit and an Extension Unit in the Technical Division have been established;

c. Detailed overall project implementation plans, including evidence that the staff of the Research and Extension Units have been hired, schedules of activities to be undertaken by these units and their equipment requirements; and

d. An operational budget for all the project activities to be financed by funds provided by the Dominican Government during the first year of implementation, including a schedule indicating when GODR disbursements will be made to the DGF account for this project.

3. Conditions Precedent to Procurement of Equipment and Vehicles

a. List of equipment and vehicles required for project implementation and a schedule for purchasing the equipment;

b. Technical specifications for specific equipment and vehicles; and

c. A plan for the assignment, control and maintenance of heavy equipment and vehicles.

4. Conditions Precedent to Training Activities

a. A detailed training plan outlining the different categories of training, and how and when training will be accomplished;

b. Detailed criteria for selection of candidates for each category of training; and

c. Plans for assignment of returning trainees to positions and tasks appropriate to their training.

5. Covenants

a. Project Evaluation

The Parties agree to establish 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: (1) evaluation of progress toward attainment of the objectives of the Project; (2) identification and evaluation of problem areas or constraints which may inhibit such attainment; (3) assessment of how such information may be used to help overcome such problems; and (4) evaluation, to the degree feasible, of the overall development impact of the Project.

b. Fiscal Support for Forestry

The GODR covenants that:

1) DGF will receive 100% of the proceeds of revenues collected by DGF as a result of the Directorate's enforcement of Law 5856;

2) The level of tax applied to imported wood products will be revised with a view towards favoring the promotion of national wood production; and

3) The DGF will be authorized to charge fees for such special technical services, or assignment of personnel to other organizations, public or private, for management planning, reforestation, forest inventories, surveys and demarcation, and the like.



Department of State
INCOMING TELEGRAM
American Embassy Santo Domingo

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TO AMEMBASSY SANTO DOMINGO 9475
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UNCLAS STATE 080813
AIDAC

MAR 20 11 28 AM '84

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State
OPD F13

E.O. 12356: N/A
TAGS: N/A
SUBJECT: DOMINICAN REPUBLIC FORESTRY GUIDANCE CABLE

ACTION:	
INFO:	
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ECN	<input checked="" type="checkbox"/>
POL	
BIO	
ECON	
FCS	
CONS	
AC	<input checked="" type="checkbox"/>
EMO	
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USICA	
PC	
IAGS	
DIR	
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PRC	
CRD	
CONT	
AGR	
IGT	
HAN	
EDJ	
UDD	
A/RF	
CHRON	<input checked="" type="checkbox"/>

1. THE DAEC REVIEW OF THE SUBJECT PROJECT WAS HELD ON WEDNESDAY, FEBRUARY 22. AT THE REVIEW, THE PID WAS APPROVED AND THE MISSION WAS AUTHORIZED TO GO FORWARD WITH PP DEVELOPMENT, SUBJECT TO THE GUIDANCE OFFERED BELOW AND TO BUREAU APPROVAL OF THE MISSION'S REVISED COSS. THE MISSION'S REQUEST FOR DELEGATION OF AUTHORITY TO APPROVE THE PP IN THE FIELD WAS GRANTED; HOWEVER IT IS SUGGESTED THAT JIM TALBOT BE INVITED TO PARTICIPATE IN THAT REVIEW, GIVEN THE SPECIALIZED TECHNICAL NATURE OF SOME OF THE PROJECT COMPONENTS. GUIDANCE FOR PP DEVELOPMENT FOLLOWS:

2. PRIOR EXPERIENCE: IN THE COURSE OF PP DEVELOPMENT, THE MISSION IS ENCOURAGED TO REVIEW PRIOR EXPERIENCE, BOTH DONOR AND HOST-COUNTRY-FUNDED, IN FORESTRY MANAGEMENT PROJECTS, SO THAT LESSONS LEARNED CAN BE INCORPORATED IN PROJECT DESIGN. TO THIS END, WE HAVE ASKED DID TO PROVIDE THE MISSION WITH ABSTRACTS OF PPS AND EVALUATIONS ON SIMILAR PROJECTS.

3. INSTITUTIONAL ARRANGEMENTS: THE DAEC DISCUSSED WHAT KINDS OF COORDINATION BETWEEN DGF AND OTHER ENTITIES INVOLVED IN FOREST MANAGEMENT WOULD BE REQUIRED FOR THE SUCCESSFUL IMPLEMENTATION OF THIS PROJECT. WHILE IT WAS RECOGNIZED THAT DGF WAS THE LOGICAL CHOICE FOR A PROJECT OF THIS NATURE, IT WAS AGREED THAT SOME PERMANENT COORDINATION MECHANISM WOULD BE REQUIRED TO AVOID OVERLAP WITH ACTIVITIES BEING FUNDED UNDER OTHER PROJECTS, TO ASSURE EXCHANGE OF INFORMATION AMONG AGENCIES WORKING IN RELATED AREAS OF INTEREST, AND TO COLLABORATE ON OPERATIONS REQUIRING PARTICIPATION BY MORE THAN ONE ENTITY. THE MISSION INDICATED IT WOULD BE EXAMINING AT LEAST TWO SUCH MECHANISMS, INCLUDING THE CNIF AND THE JCA. THE MISSION'S CHOICE SHOULD BE FULLY EXPLAINED IN THE PP, TOGETHER WITH ITS PROPOSED PROCEDURES TO ASSURE EFFECTIVE COORDINATION.

4. IN ADDITION, IN DESIGNING THE APPROPRIATE

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INSTITUTIONAL ARRANGEMENTS, THE MISSION SHOULD TAKE FULL ACCOUNT OF GOVERNMENT NEEDS TO CONSTRAIN FUTURE GROWTH OF PUBLIC SECTOR IN ITS EFFORTS TO REDUCE THE BUDGET DEFICIT. RETRAINING OF EXISTING STAFF SHOULD BE CAREFULLY EXAMINED AS SUBSTITUTE FOR INCREASING OVERALL STAFF LEVELS, AND OPTIONS FOR RELYING ON NON-GOVERNMENTAL ORGANIZATIONS SHOULD BE EXPLORED FOR OUTREACH AND PROMOTION AND/OR MONITORING FOREST USAGE, ETC.

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5. MANAGEMENT CONTROLS: WHILE THE PID MAKES A STRONG CASE THAT THE EXISTING BODY OF LEGISLATION AND REGULATIONS CONSTITUTES A SOUND BASIS FOR ASSURING THAT FOREST EXPLOITATION BY PRIVATE CONCERNS IS PROPERLY MANAGED, A CONCERN WAS EXPRESSED AT THE DAEC REVIEW THAT THESE CONTROLS MAY NOT BE ABLE TO BE EFFECTIVELY ENFORCED. THE PP SHOULD ELABORATE WHETHER THE DGF AND OTHER RELEVANT ENTITIES HAVE ADEQUATE STAFF, BUDGETARY SUPPORT, AND INFORMATION NETWORKS TO ENFORCE THE CONTROLS WRITTEN INTO GOVERNMENT LEGISLATION.

6. REFORESTATION COMPONENT: THE DAEC DISCUSSED THE PROPOSED REFORESTATION COMPONENT IN ORDER TO CLARIFY THE INTENDED OBJECTIVES. IT WAS AGREED THAT THE PROPOSED APPROACH, WHILE USEFUL AS A DEMONSTRATION/LEARNING OPPORTUNITY FOR DGF, WOULD BE APPROPRIATE ONLY FOR PUBLICLY-HELD LAND. IF THE PRIMARY OBJECTIVE OF THIS COMPONENT IS FOR PROTECTION OF CRITICAL WATERSHED AREAS SUSCEPTIBLE TO DEGRADATION, THE MISSION SHOULD IDENTIFY

WHAT SHARE OF THESE CRITICAL AREAS IS IN PUBLIC HANDS AND IS THEREFORE SUBJECT TO THE PROPOSED APPROACH. IF THE MISSION DETERMINES, IN CARRYING OUT THIS ANALYSIS, THAT A SUBSTANTIAL SHARE OF THE CRITICAL AREAS IS EITHER PRIVATELY-OWNED OR BEING UTILIZED BY PRIVATE INDIVIDUALS, THEN IT SHOULD UNDERTAKE TO DESIGN PART OF THE REFORESTATION COMPONENT TO ADDRESS THESE CIRCUMSTANCES. IN THAT EVENT THE MISSION MAY WISH TO EXPLORE ALTERNATIVE, COMMUNITY-BASED APPROACHES, WHICH COULD BE UNDERTAKEN THROUGH OPERATIONS RESEARCH UNDER THE PROJECT.

7. CREDIT FUND: THE DAEC EXPRESSED SOME CONCERN OVER THE NATURE OF THE BENEFICIARIES UNDER THE CREDIT FUND, AND WHETHER THERE WOULD BE PROVISION MADE UNDER THE PROJECT TO FACILITATE BORROWING BY SMALL-SCALE ENTERPRISES AND/OR COMMUNITY-BASED GROUPS. THE PP SHOULD ELABORATE ON WHAT MECHANISM WILL BE USED TO PROVIDE CREDIT PROMOTION AND TA, AS MAY BE REQUIRED TO REACH THESE GROUPS. PRIVATE SECTOR BANKS SHOULD BE USED AS A CHANNEL FOR CREDIT FOR COMMERCIAL FORESTRY DEVELOPMENT, UNLESS THERE ARE COMPELLING REASONS WHY THIS APPROACH IS NOT FEASIBLE.

8. IN ORDER TO COMPLY WITH GIIKA REQUIREMENTS FOR THIS

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COMPONENT, THE MISSION SHOULD ASSURE AN ADEQUATE DEMAND FOR THE VOLUME OF CREDIT PROPOSED FOR A.I.D.-FUNDING. THIS WILL REQUIRE A CAREFUL FINANCIAL ANALYSIS OF COMMERCIAL FORESTRY OPERATIONS TO CONFIRM PROFITABILITY UNDER A RANGE OF TECHNOLOGICAL CONDITIONS. A CRITICAL ELEMENT OF THIS ANALYSIS WILL BE ESTABLISHING MARKET DEMAND, WHICH SHOULD BE DISAGGREGATED BY TYPE OF PRODUCT (FUELWOOD INCLUDING FUELWOOD FOR INDUSTRIAL USE AND ELECTRICAL GENERATION, HARDWOOD, TIMBER, ETC.) THE PP SHOULD CLEARLY IDENTIFY THESE CATEGORIES AND THE EXPECTED MARKET DEMAND FOR EACH.

9. RESEARCH: THE DAEC CONCURRED WITH THE MISSION'S PROPOSED RESEARCH COMPONENT, INCLUDING THE LEVEL OF TRAINING REQUIRED FOR SUPERVISORY RESEARCH PERSONNEL. IN THE ABSENCE OF MORE HIGHLY TRAINED RESEARCH SUPERVISORS, HOWEVER, IT WAS SUGGESTED THAT FUNDS BE INCLUDED IN THE PROJECT TO PROVIDE STIPENDS TO GRADUATE STUDENTS FROM U.S. INSTITUTIONS TO CARRY OUT ONE-TO-TWO-YEAR RESEARCH PROJECTS IN THE DOMINICAN REPUBLIC. THIS WOULD SUPPORT RESEARCH EFFORTS IN TROPICAL FORESTRY, FOR WHICH FUNDING HAS BECOME EXTREMELY SCARCE, AS WELL AS PROVIDING WELL-TRAINED RESEARCHERS TO HELP SUPERVISE THE RESEARCH

PROGRAM TO BE INITIATED UNDER THIS PROJECT. IF NEEDED, THE NATIONAL ASSOCIATION OF PROFESSIONAL FORESTRY SCHOOLS AND COLLEGES COULD BE ASKED TO HELP SCREEN PROPOSALS TO ASSURE QUALITY OF PERSONNEL AND RESEARCH UNDER THIS ACTIVITY.

10. TRAINING: THE DAEC DISCUSSED DIFFERENT ALTERNATIVES FOR OBTAINING NEEDED TRAINING UNDER THE PROJECT. IN THIS CONTEXT, IT WAS NOTED THAT A RECENT BUREAU REVIEW OF CATIE IN COSTA RICA POINTED TO ITS PARTICULAR STRENGTH IN NATURAL RESOURCE MANAGEMENT. ESNACIFOP IN HONDURAS HAD A VERY GOOD TRAINING CAPABILITY BUT IT IS LIMITED TO A 3-YEAR SEQUENCE FOR TECHNICIANS. FINALLY, THE INSTITUTE FOR TROPICAL FORESTRY IN PUERTO RICO DOES NOT PROVIDE DEGREE TRAINING, BUT IS ABLE TO DESIGN SHORT-TERM WORKSHOPS AND HAS DONE SO SUCCESSFULLY FOR A REGIONALLY-FUNDED PROGRAM.

11. RECURRENT COST ANALYSIS: MORE THAN 55 PERCENT OF THE LOAN BUDGET PROPOSED IN THE PIC IS TENTATIVELY ALLOCATED TO PERSONNEL AND OPERATING COSTS. ANOTHER 10 PERCENT IS EARNMARKED FOR VEHICLES PROCUREMENT. THESE PROJECT EXPENDITURES IMPLY A RATHER SUBSTANTIAL CONTINUING OBLIGATION OF GOVERNING BUDGET RESOURCES BEYOND THE LIFE OF THE PROJECT, IF FIELD ACTIVITIES INITIATED WITH A.I.D. ASSISTANCE ARE TO BE REPLICATED. THE PP SHOULD INCLUDE A CAREFUL AND THOROUGH ANALYSIS OF THE PROJECTED COSTS OF CONTINUING DGF OPERATIONS BEYOND THE LIFE OF THIS PROJECT. THIS ANALYSIS SHOULD BE DISCUSSED WITH THE GOVERNMENT AS A BASIS FOR IDENTIFYING FUTURE FINANCING REQUIREMENTS AND WINNING GOVERNMENT COMMITMENT TO PROVIDE RESOURCES AS NEEDED FROM THE BUDGET OR OTHER SOURCES. SUCH A COMMITMENT SHOULD BE INCLUDED AS A COVENANT IN THE PROJECT AGREEMENT.

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12. YOUTH PARTICIPATION: IT WAS SUGGESTED AT THE DAEC THAT THE MISSION AND GOUR MIGHT CONSIDER WAYS IN WHICH YOUTH MIGHT BE ORGANIZED TO PARTICIPATE IN REFORESTATION ACTIVITIES. THIS APPROACH HAS BEEN SUCCESSFULLY APPLIED IN A NUMBER OF COUNTRIES, OF WHICH ARCHIE CARR'S ORGANIZATION IN COSTA RICA IS PERHAPS THE MOST PROMINENT. A COMPANION OPG TO THIS PROJECT MIGHT BE A USEFUL STRATEGY FOR TESTING/DEVELOPING THIS IDEA.

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13. PROJECT MANAGEMENT: THE DAEC DISCUSSED THE QUESTION OF MISSION STAFFING FOR MANAGEMENT OF THIS PROJECT.

SINCE THIS PROJECT WILL BRING THE MISSION'S PORTFOLIO IN NATURAL RESOURCE MANAGEMENT TO A TOTAL OF FOUR PROJECTS REPRESENTING NEARLY DOLS 40.0 MILLION (30 PERCENT OF PROJECT PORTFOLIO) IT WAS THOUGHT THAT THE MISSION SHOULD GIVE CONSIDERATION TO RECRUITING ADDITIONAL STAFF SUPPORT IN THAT AREA. RECOGNIZING THAT THERE IS LITTLE POSSIBILITY OF OBTAINING ADDITIONAL USOP SLOTS, AND THAT OUR FUNDS ARE SEVERELY LIMITED, THE ONLY PRACTICAL SOLUTION IS LIKELY TO BE TO FUND A PSC CONTRACTOR WITH PROJECT RESOURCES. FOR THE MEDIUM-TERM (FOR FY 86 AND BEYOND), HOWEVER, MISSION MAY WISH TO EXPLORE THE POSSIBILITY OF ARRANGING FOR A POSITION UNDER THE JOINT CAREER CORPS (JCC) PROGRAM. S AND T IS MAKING A BID TO EXPAND THE PROGRAM BY AN ADDITIONAL 25 SLOTS BY 1985. WE WILL FORWARD YOU MORE DETAILS ON THE PROGRAM IF THERE IS INTEREST, OR YOU MAY CONTACT ERVEN LONG, ST/RUR DIRECTLY. PLEASE ADVISE.

14. IEE: THE IEE IS WELL DONE; HOWEVER REQUIRES AN AMENDMENT PRIOR TO APPROVAL WHICH WILL INCLUDE (A) A RISK-BENEFIT ANALYSIS ON PESTICIDES (PR-BA) TO BE USED; (B) A BRIEF OUTLINE OF THE ELEMENTS INCLUDED IN A FOREST MANAGEMENT PLAN TO BE REQUIRED BY THE DGF PRIOR TO COMMERCIAL CUTTING; AND (C) STEPS TO BE TAKEN TO STRENGTHEN DGF'S ABILITY TO PROTECT ENDANGERED SPECIES AND THEIR HABITATS DURING COMMERCIAL LOGGING ACTIVITIES. THE PR-BA WILL BE DONE PER OUTLINE IN RFG 16 AND NEEDS TO BE DONE BY QUALIFIED FOREST ENTOMOLOGIST. SUGGEST MISSION CONTACT JOHN PALMER OF ESP FOR RECOMMENDATION. SEND AMENDED IEE TO J. HESTER IN LAC/DF FOR FINAL APPROVAL. SHULTZ

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ANNEX B
PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: FY 84 to FY 88
Total U.S. Funding: \$8.0 million
Date of Preparation: June 31, 1984

Project Title & Number: Forestry Management, 517-0173

	MEASURE OF GOAL ACHIEVEMENT	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><u>Project Goals:</u> (1) To increase the long-term employment and income potential of the rural population of the Dominican Republic, especially the rural poor; (2) To generate import substitution of wood products and savings of foreign exchange; and (3) to improve conservation practices in the Dominican Republic.</p>	<ul style="list-style-type: none"> - Deforestation has been reduced to controlled levels. - Net increase in rural employment related to forestry and wood. - Efficient organizations managing forest resources. 	<ul style="list-style-type: none"> - Inventory of forest resources. - Evaluation surveys: - Research reports, fire control records, professional training records, and private forest management plans. 	<ul style="list-style-type: none"> - Appropriate legislation is enforced. - GODR continues to support forestry policies through provision of incentives for investment. - GODR is steadfast in pursuit of rational forest management.
<p><u>Project Purpose:</u> (1) To promote sound public sector forest management by DGF; (2) to promote private sector investment in production forestry; and (3) to strengthen the institutional capacity of the Dirección General Forestal (DGF) to fulfill its mandate for the forestry sector.</p>	<ul style="list-style-type: none"> - Professionally trained staff in reorganized DGF with sufficient equipment to carry out its mandate. - Marketing, financial, technical and policy analyses completed and implemented by private sector (marketing, financial and technical), and GODR (policy). - Credit fund established for private sector forestry development. 	<ul style="list-style-type: none"> - Number of professional staff, number of technical units in operation, number of projects undertaken. - Analysis reports submitted. - Loans made on DGF approved plans. 	<ul style="list-style-type: none"> - Actual plans for the DGF reorganization will be implemented. - Continued government support. - Sufficiently attractive incentives for private sector. - Forest land will be made available for project. - Market for wood products remains strong.
<p><u>Outputs.</u> Strengthened DGF with a new managerial organization and structure with: 1) Institutional strengthening: -15 B.S. foresters; 5 M.S. foresters; 70 forestry technicians trained; 240 trained forest guards; Research Unit established; Extension Unit established; fire control</p>	<ul style="list-style-type: none"> 1) 15 foresters with B.S. degrees; 5 foresters with M.S. degrees; 70 forest technicians trained; 240 forest guards trained; 10 short courses offered. 2) Field activities completed. 	<ul style="list-style-type: none"> - DGF and AID project. - Records. - Field Checks. - Evaluation Reports. 	<ul style="list-style-type: none"> - Qualified GODR personnel available as needed. - Qualified technical assistance available as needed. - Cooperation and support from other GODR agencies forthcoming.

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- equipment; transportation equipment; remodeled offices; conference room, etc. -10 short courses to 200 farmers' participants.
- 2) Field activities completed, 3,000 ha. reforested; 114,700 ha. forest inventory; 60,000 ha. forest management plans completed; 68,000 ha. forest land demarcated; 2 field office management plan implementation started; prefeasibility analysis of a third site executed.
 - 3) Private Sector Forestry Credit funds made available for private forestry development and investment.
 - 4) DGF administrative and management plans done.
 - 5) Analysis of marketing, finances, technologies and policy.

- 3) Credit fund operating.
- 4) T.A. reports, studies, etc., completed.

PROJECT INPUTS - (\$ 000)

Component	AID			Total AID	GODR	Total
	Loan-FX	Loan-LC	Grant			
- Technical Assistance	-	-	1,728	1,728	-	1,724
- Vehicles/Parts	626	-	-	626	-	626
- Heavy Equipment/Parts	768	-	-	768	-	768
- Equipment/Materials	666	243	-	909	846	1,755
- Training	870	-	-	870	770	1,640
- Infrastructure	255	230	-	485	250	735
- Technical Services	75	275	-	350	314	664
- Operating Costs	-	689	-	689	897	1,586
- Personnel	-	-	-	-	2,078	2,078
- Credit	-	-	-	-	5,000	5,000
- Evaluation	-	-	72	72	-	72
Subtotal	3,260	1,437	1,800	6,497	10,155	16,652
- Procurement Agent and Transport.	395	-	-	395	-	395
- Contingency and Inflation	575	250	200	1,025	1,200	2,225
Total (Rounded)	4,300	1,700	2,000	8,000	11,400	19,400

!- Receipts and or equipment on-hand.
!- Disbursement records.

!- Counterpart contributions will be made on time at planned rate of disbursement.

LAC/DR-IEE-84-25

ENVIRONMENTAL THRESHOLD DECISION

Project Location Dominican Republic

Project Title and Number : Forestry Management
517-0173

Funding : \$1,000,000 G
\$6,000,000 L

Life of Project : Five years
(84-89)

IEE Prepared by : Betty Facey, USAID/Santo Domingo
Engineer

Recommended Threshold Decision : Negative Determination

Bureau Threshold Decision : Concur with Recommendation

Copy to : Philip Schwab, Mission Director
USAID/Santo Domingo

Copy to : Wendy Stickel, LAC/DR

Copy to : Betty Facey, USAID/Santo Domingo

Copy to : IEE File

James S. Hester Date JUN 12 1984

James S. Hester
Chief Environmental Officer
Bureau for Latin America
and the Caribbean

CERTIFICATION PURSUANT TO
Section 611 (e) of the
FOREIGN ASSISTANCE ACT
As Amended

I, Philip R. Schwab, the principal officer of the Agency for International Development in the Dominican Republic, do herewith certify that in my judgment, the Dominican Republic has both the financial capability and human resources to maintain and utilize effectively goods and services procured under the capital assistance project entitled Forestry Management.

This judgement is based upon the record of implementation of AID financed projects in the Dominican Republic and the results of the consultations undertaken during intensive review of this new project.



Philip R. Schwab
Director, USAID Dominican Republic

August 13, 1984
Date

5C (1) COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481. Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully? No

2. 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 a citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? No

3. FAA Sec. 620(e)(1). If assistance is to a government, has it (including 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

4. FAA Sec. 532 (c), 620 (a), 620 (f), 620D; FY 1982 Appropriation Act Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver? No

5. ISDCA of 1981 Secs. 724, 727 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISDCA of 1981. N/A

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

7. FAA Sec. 620 (1). Has the country failed to enter into an agreement with OPIC? No

8. FAA Sec. 620(o); Fishermen'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 activities in international waters? N/A
- (b) If so, has any deduction required by Fishermen's Protective Act been made?
9. FAA Sec. 620 (q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country? No
- (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 appropriation bill appropriates funds? No
10. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has 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

11. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?
- No. Diplomatic relations have not been severed.
12. 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 AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taxing into Consideration memo.)
- GODR is current on U.N. obligations.
13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 510. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?
- No
- No
14. FAA Sec. 666. 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 FAA?
- No

15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements on safeguards? 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, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)

No

16. 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 Session of the General Assembly of the U.N. of Sept. 25 and 28, 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.)

N/A

17. ISDCA of 1981 Sec. 721. See special requirements for assistance to Haiti.

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. 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

a. 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 country made such significant improvements in its human rights record that furnishing such assistance is in the national interest? No

b. ISDCA of 1981, Sec. 725 (b). If ESF is to be furnished to Argentina, has the President certified that (1) the Government of Argentina has made significant progress in human rights; and (2) such assistance is in the national interests of the U.S.? N/A

c. ISDCA of 1981, Sec. 726 (b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Government of Chile has made significant progress in human rights; (2) it is in the national interest of the U.S.; and (3) the Government of Chile is not aiding international terrorism and has taken steps to bring to justice those indicated in connection with the murder of Orlando Letelier? N/A

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5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to project funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance Loans, and B.3. applies to projects funded from ESP.

CROSS REFERENCES:

IS COUNTRY CHECKLIST UP TO DATE? Yes.
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT? Yes.

A. GENERAL CRITERIA FOR PROJECT

1. FY 82 Appropriation Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations Committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that amount)?

(a) The project was included in the FY 84 Congressional Presentation as a new project in FY 84. The Congressional notification expired on June 27, 1984. State 222320 allotted funding to the Mission.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

(a) Not Applicable.
(b) Yes.

3. FAA Sec. 611(a)(2). If further 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?

The Project will need to be ratified by the Dominican Congress. In the past AID projects have been ratified in a timely manner.

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4. FAA Sec. 611 (b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973? (See AID Handbook 3 for new guidelines.)
Not Applicable.
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all 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?
Not Applicable.
6. FAA Sec. 209. Is project susceptible of 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.
The Project cannot be executed as part of a regional project.
7. FAA Sec. 601(a). Information and conclusions whether project 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.
This project will indirectly increase the flow of international trade by encouraging increased agricultural production. The project will encourage private small farmer initiatives in forestry management and increased agriculture production. It will improve the technical efficiency of agriculture through improved farming, and forestry management practices. Further, the project will discourage monopolistic practices, and will encourage community action with respect to forestry management. The project will encourage forestry producer associations and will not have any direct effect on free labor unions.

8. FAA Sec. 601 (b). Information and conclusion 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).
The technical assistance and equipment for the project will be procured from U.S. private sector sources.
9. FAA Sec. 612(b); Sec. 636(h); FY 1982 Appropriation Act Sec. 508. 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 project agreement will require that counterpart contribution be used in the implementation of project activities.
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?
There is no excess, U.S. owned local currency available for this program.
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?
Yes.
12. FY 1982 Appropriation Act Sec. 522. 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?
Not Applicable.

13. FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16? Does the project or program take into consideration the problem of the destruction of tropical forests. Yes.
14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)? Not Applicable.

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B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project
Criteria

a. FAA Sec. 102(b); Sec. 111; 113; 281 (a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the 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 Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?

The project is directed to the promotion of the participation of the rural poor in the benefits of development. This will be accomplished through the planning and implementation of farm level forestry management activities in two pilot areas. The resulting gain from this improved forestry management will include increased income from agricultural production and increased employment; substitution of imports, the reliance of this project on community and/or local private groups and governmental institutions for planning and implementation will encourage rural poor participation at the individual, group and community level. This program is designed to reinforce the concept of community participation. This project will also promote the participation of women in cooperative type units and educational programs. This project will indirectly promote regional cooperation by increasing the flow of interregional trade and by fostering cooperative efforts to tackle similar problems within the region through the interchange of experience and information.

Yes.

c. FAA Sec. 107. Is appropriate emphasis 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 Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement been waived for "relatively least-developed" country)?

The recipient country is providing 57% of the total cost of the project.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least-developed?" (M.O. 1232.1 defined a capital project as "the construction, expansion, equipping or alteration of a physical facility or facilities financed by AID dollar assistance of not less than \$100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character.

Not Applicable

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f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes.

g. 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 supports development and promotes skills of both administrative and technical personnel through OJT , seminars and workshops. Furthermore, local institutions and individuals would be much utilized in the project.

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.

Not Applicable.

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% of the enterprise's annual production during the life of the loan?

Not Applicable.

3. Economic Support Fund
Project Criteria

- a. FAA Sec. 531(a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of section 102? Yes.
- b. FAA Sec. 531 (c). Will assistance under this chapter be used for military, or paramilitary activities? No.
- c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives. Not Applicable.
- 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 be made? Not Applicable.

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. 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 offshore procurement of agricultural commodity or product 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 countries otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one of these areas? N/A
6. FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum 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 that such vessels are available at fair and reasonable rates? No
7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? Yes
8. International Air Transport. 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

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9. FY 1982 Appropriation Act 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

B. Construction

1. FAA Sec. 601 (d). If capital (e.g., construction) project, will U.S. engineering and professional services to be used? No
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. 602(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)? N/A

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% 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 aid projects or activities of the Communist-bloc countries? Yes
4. Will arrangements preclude use of financing:
- a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525:
(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; (4) to lobby for abortion? Yes
- b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? Yes
- c. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes
- d. FAA Sec. 662. For CIA activities? Yes

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- e. 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
- f. FY 1982 Appropriation Act, Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel? Yes
- g. FY 1982 Appropriation Act, Sec. 505. To pay U.N. assessments, arrearages or dues? Yes
- h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)? Yes
- i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields? Yes
5. FY 1982 Appropriation Act, Sec. 511. Will assistance be provided 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? No
6. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress? No

ANNEX G-1
PROJECT IMPLEMENTATION SCHEDULE

<u>ACTIVITY</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>	<u>YEAR 5</u>
<u>1. Technical Activities-</u> <u>Public Forest Management</u>					
a. Comprehensive Inventory	!	!	!	!	!
b. Mgt. Plan Development	! Site 1	! Site 2		! Site-3	!
c. Public Forest Land Demarcation	!	!	!	!	!
d. Sub-District Office Support	!	!	!	!	!
e. Mgt. Plan Implementation	!	!	!	!	!
f. Fire Control	!	!	!	!	!
g. Forestry Research	!	!	!	!	!
<u>2. Private Sector Forestry Development</u>					
a. Extension	!	!	!	!	!
b. Market Analysis and Development	!	!	!	!	!
c. Credit Fund	!	!	!	!	!
<u>3. Strengthening of DGF</u>					
a. Organization and Management	!	!	!	!	!
b. Personnel and Training	!	!	!	!	!
c. Facilities and Equipment	!	!	!	!	!

Long and Short Term Training Schedule

P a r t i c i p a n t s

LONG TERM TRAINING

	85	86	87	88	89	90	91	92	Total
I. Overseas									
A. <u>M.S. Level Program</u>									
- Forest Economics and Planning			1						1
- Forest/Range Management				1					1
- Forest Industries and Utilization				1					1
- Forest /Public Administration		1							1
- Forest Pathology/Silviculture				1					1
Subtotal									5
B. <u>B.S. Level Program</u>									
			8						8
				7					7
Subtotal									15
C. Esnacifor Level Dasónomo (3 yrs.)									
Subtotal				10					10
II. In Country									
A. Forestry Technician (perito) 2 yrs.									
				30					30
					30				30
Subtotal									60
<u>SHORT TERM</u>									
A. Forest Guards 3 months									240
Subtotal Long Term									90
Total Long/Short Term									330

In Country Short Courses

Activity	Duration	Short Courses					Total	Participants					Total
		85	86	87	88	89		85	86	87	88	89	
Fire Control	1 wk	2	2	2	2	2	10	40	40	40	40	40	200
Field day	1 day	2	2	2	2	2	10	40	40	40	40	40	200

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EQUIPMENT PROCUREMENT LIST
(\$ 000)

	FX	LC	TOTAL
1. a. DGF Reorganization and Staff Training			
2 typewriters, electric x \$3	6		6
2 desk electronic calculators x \$500	1		1
10 radio communication x \$2.5	25		25
1 computer-micro	25		25
Furniture		<u>44</u>	<u>44</u>
Sub Total.....	57	44	101
1.b. Fire Control			
20 radio comm. units x \$2.05	50		50
8 water supply equipments	30		30
Furniture		<u>6</u>	<u>6</u>
Sub Total.....	80	6	86
1.c. Forestry Research			
Lab Equipment (to be determined by advisor)	60		60
Furniture		<u>3</u>	<u>3</u>
Sub Total.....	60	3	63
2.a. District Office Support			
2 radio sets x \$2.5	5		5
2 typewriters	3		3
Kitchen	4		4
Furniture		<u>6</u>	<u>6</u>
Sub Total.....	12	6	18
2.b. Public Forest Land Demarcation			
Surveying Equip. (see details)	25		25
Office		<u>20</u>	<u>20</u>
Sub Total.....	25	20	45

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2.c. Cartographic (see details below)	50		50
Sub Total.....	50		50
2.d. Feasibility Study/Management Plan Development			
Forestry Equipment (see details)	50		50
Drafting Equip.	15	5	20
Micro computer	<u>25</u>		<u>25</u>
Sub Total.....	90	5	95
2.e. Plan Implementation			
8 radio Comm. sets and accessories x \$2.5	20		20
2 water pumps and parts	15		15
2 irrigation systems	<u>48</u>	<u>48</u>
Sub Total.....	35	48	83
3.c. Forestry Extension			
Audio-visual equipment (to be determined by advisor)	125		125
Office	7		7
Materials	<u>40</u>	<u>15</u>	<u>55</u>
Sub Total.....	<u>172</u>	<u>15</u>	<u>187</u>
Grand Total.....	<u><u>\$ 581</u></u>	<u><u>147</u></u>	<u><u>728</u></u>

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FIRE CONTROL EQUIPMENT

(Ben Meadows Co., 15th edition)

QUANT	ITEM	REF.No.	EACH US\$	TOTAL US\$
300	Pulaski Axe	160755	23.50	7,050.00
300	Fire Rake	170604	15.50	4,650.00
300	McLeod Fire Tool	170600	40.00	12,000.00
300	Osborne Pattern Adze Hoe	170602	26.15	7,845.00
300	Razor-Back	161412	15.50	4,650.00
60	MSA "T" Aluminium Caps	131768	11.75	705.00
200	Staz-on Suspension Caps	131845	3.15	630.00
400	Machetes c/Baquetas	-	* 14.00	* 5,600.00
50 doc.	Limas #12 Grano Fino	-	*102.00	* 5,100.00
100	Heavy Duty Canteens	240812	7.80	780.00
100	Heavy Duty Canteens	240810	7.35	735.00
50	Mochilas	240053	106.90	5,345.00
150	Mochilas	240053	40.40	6,060.00
200	Frazadas Tipo Militar	-	* 35.00	* 7,000.00
100	Sleeping Bags Retriever	240180	29.25	2,925.00
100	Go-Kot	240332	59.95	5,995.00
12	Chateau	240290	267.00	3,204.00
24	Chenango Fly	240297	79.00	1,896.00
24	Sierra Cook Kit	240740	21.00	504.00
12	Holiday Cook Kit	240736	52.60	631.20
200	Pares de Botas	-	* 35.00	* 7,000.00
50	JKIT	130012	25.15	1,257.50
6	First Station With Por.Ox.	133110	298.40	1,790.40
150	Abrigos de Lona	-	* 50.00	* 7,500.00
50	Binoculares	240925	175.75	8,787.50
50	Tanques para Agua (6 gal.)	240584	11.45	572.50
50	Tanques para Agua (2 1/2 gal.)	240582	7.50	375.00
24	Drip Torch	170400	94.25	2,262.00
50	Military Type Gas Can	241240	30.25	1,512.50
200	Fire Beater	170560	19.45	3,890.00
				117,241.10
				=====

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NOTE:

US\$86,052.60

RD\$32,200.00

== \$17,241.10 ==

RADIO COMMUNICATION EQUIPMENT

QUANT	ITEM	EACH US\$	TOTAL US\$
20	Radios Telephones	2,200	44,000.00
	Parts		<u>6,000.00</u>
			<u>50,000.00</u>
			=====

WATER SUPPLY EQUIPMENT

QUANT	ITEM	EACH US\$	TOTAL US\$
	Water System	3,125.00	25,000.00
			=====

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PUBLIC FOREST LAND DEMARCATION

EQUIPMENT LIST

BEN MEADOWS, CO. 15th EDITION

<u>PAGE</u>	<u>QTY</u>	<u>ITEM</u>	<u>REF. #</u>	<u>US\$EACH</u>	<u>US\$TOTAL</u>
48	10	Berger Astron Transits	100280	1,560	15,600
48	10	Tripods	100112	150	1,500
67	20	Fiberglass Frisco Rods	108782	110	2,200
74	20	Range Poles	100890	36	720
81	20	Plumb Bobs	101228	10.20	204
177	10	Reels Tapes	120580	75.75	758
*	10	Electronic Portable Calculator		50	<u>500</u>
Total					\$21,482 =====

Any source (non-listed in Ben Meadows, Co.).

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FEASIBILITY ANALYSIS CARTOGRAPHIC EQUIPMENT

(Ben Meadows Company
15th Edition)

<u>No.</u>	<u>Página</u>	<u>Cantidad</u>	<u>Artículo</u>	<u>Referencia</u>	<u>Precio Unitario</u>	<u>Total</u>
1	293	2	Kail Aurofocus (Model K-A5)	090462	\$5,082.00	\$10,164.00
2	301	2	The Atterbury Port-A-Scope	090045	2,495.00	4,990.00
3	302	2	Condor T-22 y Dual Stereoscope	090075	3,975.00	7,950.00
4	311	10	Type 122 GE Stereometer Parallax Bar	090074	195.00	1,950.00
5	310	20	Wid TSPI Pocket Mirrot Stereoscope	090260	222.00	4,440.00
6	308	20	SV-1 Abrams 2-Pwer Stereoscope	090018	55.00	1,100.00
7	312	10	Dot Counter	090190	99.50	995.00
8	314	2	Aero-Sketchmaster	090100	3,020.00	6,040.00
9	316	2	Field Outfit for Aerial Phot. Interp.	090020	430.50	861.00
10	209	10	Drawing Instrumente Sets	020020	32.36	323.60
11	212	10	Triangular Scales	030004	22.50	225.00
12	199	10	Metric-English Meter Sticks	121801	3.50	35.00
13	206	2	Teledyne Rotolite (Model 201K42)	011052	825.00	1,650.00
14	214	10	Circular Protractors	040072	1.50	15.00
15	216	10	Transparents Irregular Curves: Patern No. 6	070750	0.95	9.50
16	216	10	Pattern No. 8	040751	1.25	12.50
17	216	10	Pattern No. 15	040756	1.80	18.00
18	216	10	Pattern No. 16	040757	1.90	19.00
19	216	10	Pattern No. 19	040760	2.00	20.00
20	216	10	"Curvex" Flexible Curve Ruler	040494	3.75	37.50
21	218	4	Stainless Steel Straightadges	040540	16.35	65.40

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FEASIBILITY ANALYSIS CARTOGRAPHIC EQUIPMENT

<u>No.</u>	<u>Página</u>	<u>Cantidad</u>	<u>Artículo</u>	<u>Referencia</u>	<u>Precio Unitario</u>	<u>Total</u>
22	218	10	Wood Acrylic T - Squares	040640	\$10.75	\$107.50
23	218	4	Parallel Ruling Straightedges	040606	41.25	165.00
24	219	10	Triangles 30/60	040277	2.85	28.50
25	219	10	Triangles 45/90	040293	3.80	38.00
26	221	10	Metric Circle Master	042104	2.50	25.00
27	221	10	Metric General Purpose	042106	2.90	29.00
28	222	10	Directional and Dimensional Indicator	040857	2.50	25.00
29	230	4	Polar Compensating Digital Planimeter	050690	359.00	1,436.00
30	231	4	Adjustable Arm Planimeters	050386	378.50	1,514.00
31	240	5	Curvimeters Map Measure	050400	13.95	69.75
32	264	5	Leroy Standard Lettering Sets	063000	276.00	1,380.00
33	267	5	Leroy Standard Lettering Templates	063196	21.45	107.25
34	267	5	Leroy Standard Lettering Templates	063198	21.45	107.25
35	268	5	Leroy Reservoir Pens	063050	51.25	256.25
36	268	5	Leroy Pens	063252	11.25	56.25
37	268	10	Leroy Replacement Points	063356	9.00	90.00
38	268	10	Leroy Replacement Points	063358	8.00	80.00
39	268	10	Leroy Replacement Points	063360	7.00	70.00
40	268	10	Leroy Replacement Points	063362	7.00	70.00
41	270	2	Ultrasonic Pen Cleaner	063030	74.00	148.00
42	270	5	Pen Cleaning Fluid Bottles	064392	2.95	14.75
43	277	3	Tracing Tables	070150	447.00	1,341.00
44	291	3	Drafting Jamps	071250	63.00	189.00
45	261	3	Heavy Duty Electric Eracer	061580	47.50	142.50
46	261	5	Replacement Secrew Collet	061582	5.25	26.25
Total						48,436.75

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FORESTRY EQUIPMENT

BEN MEADOWS, CO., 15TH EDITION

PAGE	QUANT.	ITEM	REF. NO.	US\$ EACH	US\$ TOTAL
29	1	Digital Theodolite TM-6	100131	4,495.00	4,495.00
46	1	Wide Frame Tripod	100155	195.00	195.00
76	4	ACCU Level	109050	299.00	1,196.00
78	50	Striped Plastic Flagging	101442	1.20	60.00
78	50	" " "	101446	1.20	60.00
78	50	" " "	101450	1.20	60.00
78	50	" " "	101454	1.20	60.00
78	50	" " "	101455	1.20	60.00
79	20	Flagging Dispenser	101390	5.50	116.00
80	20	Surveyors 7-Pocket Pouch	100992	21.34	426.80
100	5	Metric Altimeter/Barometer	102112	141.95	709.55
100	5	Leather Case for 2000 Models	102141	15.65	78.25
113	4	Brunton Digital Compass	101835	1,055.95	4,223.80
115	50	Isogonic Map	101916	11.00	550.00
119	50	Liquid Filled Hand Compasses	101930	21.00	1,250.00
119	50	Leather Case	101943	5.70	285.00
126	25	Clinometer with Range Finder	102213	120.00	3,000.00
126	25	SUUNTO Relaskop	109202	130.00	3,000.00
126	50	Leather Case	102214	4.50	225.00
127	10	The Spiegel Relaskop	102152	650.00	6,500.00
127	20	Leather Case	102154	16.00	320.00
127	20	Tripod	102155	27.30	546.00
127	5	Wide Scale Relaskop	102158	656.00	3,250.00
157	5	The Spiegel Relaskop	102150	650.00	3,250.00
129	2	Blume-Leiss Altimeter	102516	235.35	470.70
192	20	Refill	121578	8.50	17.00
192	20	Loggers Tape	121568	41.95	839.00
141	20	Wood Fibre Clipboards	102838	1.10	22.00
141	20	" " "	102840	1.25	25.00
141	50	" " "	102841	1.35	67.50
141	20	" " "	102842	1.40	28.00
140	20	Log Book Cover	102770	10.70	214.00
140	50	" " "	102772	16.00	800.00

153	10	Calipers	103328	37.00	370.00
153	10	Calipers	103332	10.65	106.50
154	10	Stopwatches	103242	99.00	990.00
157	20	Spring Loaded Bark Gauge	105002	32.50	650.00
157	50	" "	105004	32.50	1,625.00
157	15	Aluminium Calipers	105045	75.30	1,129.50
157	15	Aluminium Calipers	105054	75.30	1,129.50
158	5	Increment Borers	105520	143.20	716.00
159	5	" "	105590	61.75	308.75
159	10	" "	105596	83.50	835.00
161	10	Increment Hammer	105075	35.95	359.50
161	10	Extra Cutting Bit	105076	7.95	79.50
161	10	Extra Plunger	105077	5.95	59.50
185	10	Metric-English Derrick	122440	206.50	2,065.00
186	10	Metric-English Ni-Clad	122156	21.20	212.00
186	10	" " "	122164	71.90	719.00
187	10	Lufkin Economy Line	122108	17.10	171.00
187	25	Diameter Tape	122114	7.70	192.50
187	20	Metric-Decimal Ultralok	121365	10.25	205.00
190	20	Metric-Diameter Tapes	122470	25.35	507.00
201	5	Wood Moisture Gauges	222005	149.95	749.75
196	5	Polyclad Rope Chains	121601	46.95	234.75
196	5	Polyclad Rope Chains	21598	58.95	294.75
197	10	Rules Red End Extension	121878	9.45	94.50
TOTAL					\$50,202.90

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VEHICLE PROCUREMENT LIST
by Activity

<u>ACTIVITY</u>	FX (\$000)
A. Institutional Strengthening	
1. DGF Reorganization and Staff Training	
5 4 WD x \$15,000	75
1 Motorcycle	<u>1</u>
	76
2. Fire Control	
1 4 WD x \$15,000	15
6 Pick-ups x \$15,000	<u>90</u>
	105
3. Forestry Research	
2 Pickups x \$15,000	30
6 Motorcycles x \$1,000	<u>6</u>
	36
B. DGF Public Forest Management	
1. District Office Support	
2 pickups x \$15,000	30
2 4 WD x \$15,000	30
4 Motorcycle x \$1,000	<u>4</u>
	64
2. Public Forest Land Demarcation	
2 pickups x \$15,000	<u>30</u>
	30
3. Feasibility Study/Management Plan Development	
3 pickups x \$15,000	<u>30</u>

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	FX (\$000)
4. Plan Implementation	
2 bulldozers x \$125,000	250
2 Graders x \$80,000	160
2 Tractors x 25,000	50
2 Trucks - (dump) x 25,000	50
4 Motorcycles x \$1,000	<u>4</u>
	514
C. Private Sector Support Development	
1. Credit Fund	
2 4WD x \$15,000	30
2. Forestry Extension	
2 pickups x \$15,000	30
10 motorcycle x \$1,000	<u>10</u>
	70
Total.....	<u>\$925</u>

Summary Table Vehicle Types and Cost

10 4WD x \$15,000	150
16 pickups x \$15,000	240
25 motorcycles x \$1,000	25
2 bulldozers x \$125,000	250
2 graders x \$80,000	160
2 dump-trucks x \$25,000	50
2 tractors x \$25,000	<u>50</u>
Total	<u>925</u>
Vehicles Spare Parts Procurement	<u>469</u>

Total vehicles and spare parts \$ 1,394

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Information Required for Prefeasibility Studies

1) Land Tenure. Maps should be prepared showing the location of public land suggested for reservation as national forests. The land area within each proposed national forest should be as contiguous as possible, but it should be expected that the forests will include some noncontiguous parcels of land separated by land in private ownership. DGF will need to work in close collaboration with the Office of Cadastral Survey and other relevant government agencies to gather this information.

2) Forest Cover. Areas considered should be primarily in forest cover, mostly at least 50 percent stocked, but some unforested areas may be included as long as they are in obvious government ownership. Type maps should be prepared showing the location of the principal cover types and land uses in and around the forests.

3) Size. The studies should specify the surface areas of the proposed national forests. As recommended in the National Forest Management Plan, national forests should generally be at least 8,000 ha in area and probably not more than about 40,000 ha in size. However, smaller areas of regional or national importance, such as the Sabana de San Juan, should also be considered.

4) Access. The studies should give the locations of existing roads and describe their trafficability. General recommendations for future road development and air strips should be made.

5) Topography. Topography maps of the proposed national forests should be obtained. Such maps at 1:50,000 scale are readily available.

6) Site Information. From existing sources, information should be collected on the soils of the areas (include maps if available), rainfall amount and distribution, evapotranspiration and the incidence of frost.

7) Forest Condition. The studies should include general descriptions of the condition of the forests, including age distribution of the stands, volume, tree size, form, damage by fire and hurricanes, attacks by pests, and diseases, species distribution, and estimates of growth and yield potential.

8) Utilization Options. For each of the principal cover types, utilization options should be suggested, such as harvesting, planting, grazing, etc. Consideration should be given to the production of multiple benefits, especially wood, water, wildlife, livestock and recreation.

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9) Critical Areas. Areas in need of special management, such as critical watersheds or habitats of endangered species should be identified and management options outlined. The benefits to be accrued from wise conservation of such areas should be specified.

10) Silvicultural Treatment. General recommendations should be made on the silvicultural treatments needed in the principal forest types, both before and after harvesting.

11) Human Factors. Social profiles of the people living in the vicinities of the proposed national forests should be made. The profiles should include estimates of the number of individuals, areas of concentration and their occupation. Further information on these profiles is given in the social analysis.

12) Infrastructure Needs. In addition to access roads, the studies should indicate other types of infrastructure needed to manage the proposed national forests, such as offices, residences, water supplies and communication means (telephone, radio).

13) Development and Conservation Potential. A major objective of the studies should be to provide general indications of the development and conservation potentials of the prospective national forests. These should include preliminary estimates of the costs and returns from harvesting, from other forest practices such as resination and grazing, and from protection and conservation, and their impact on the local and national economy.

14) Future Action. The prefeasibility studies should conclude with suggestions for future action, both immediate and long-term. For forests with substantial development potential, the studies should describe what information should be collected and analyzed in greater detail during a feasibility study.

Timber Management Plan Outline*

The quality of a timber management plan is dependent on the quality of information utilized in its development. The time needed to develop an adequate plan is dependent on the amount and quality of information available. An accurate determination of resource capabilities, environmental effects, social implications, economic costs and benefits, and monitoring needs are necessary ingredients to an adequate plan.

Outlined below are the bare components of a timber management plan. There are entire volumes of information dedicated to the "hows" for completing each of these components. The simplicity of the outline should not be allowed to obscure the complexity of the task, nor should the complexity of the task be allowed to obscure the objective of making a realistic, sound resource management decision.

I. Management Goals and Objectives

Task: Determine the management goals and objectives, such as, in its simplest form, multiple resource use and sustained yield or intensive timber management and sustained yield. Goals and objectives must comply with the country's laws and regulations.

II. Resource, Social and Environmental Situation

Task: Describe the present resource, social and environmental situation and provide future images of what these will be like under this timber management plan.

III. Management Direction - Selected Alternative

Task: This is the most involved of the tasks and generally requires a series of steps that are retraced with each re-evaluation of the plan. These steps, in turn, are composed of many subparts. In brief, these steps are: 1) identify data needs, 2) gather data, 3) evaluate data, 4) determine soft spots and voids in data, 5) collect more data, redefine goals and objectives if necessary, 6) determine land use capabilities, 7) develop alternatives (this includes dividing the resource area into logical management units, determining timber resource capability and sustainability, identifying mitigative measures to minimize environmental and social

*Developed by John E. Palmer, USDA Forest Service, Forestry Support Program.

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impacts, developing vegetation management practices, setting timber resource harvesting and reforestation schedules for each alternative), 8) assess economic costs and benefits, 9) assess the social and environmental effects of each alternative, 10) select an alternative. This section would contain the management direction including mitigative measures of that alternative. An example of step one is attached for your information.

IV. Monitoring and Evaluation

Task: Establish the monitoring necessary to ensure that goals and objectives are met, management direction in the plan is followed, mitigative measures are followed and adequate, social and environmental effects are within the limits determined, and that these limits are proving satisfactory. Establish a fixed time schedule for a complete re-evaluation of the plan, for example every 3 or 5 years. There should also be adequate flexibility to allow immediate evaluation and alteration of the plan when circumstance or new resource information require it. Set schedules for gathering and evaluating data where soft spots and voids exist.

Complementary to the management plan an implementation plan is needed to ensure that the plan will be implemented and followed, identify who will execute that plan, and because implementation requires trained personnel, who, how, and when will they be trained. Timber management plans for large areas are based on averages and generalization of the data available. It may be necessary to follow up such a general plan with site specific assessments of each area planned for harvesting. A set of practices can be established and included in section III, Management Direction, to guide site specific assessments.

An estimate of the minimum effort needed to develop an adequate timber management plan is 6 to 8 months with an interdisciplinary team of experts, which could include a forest management specialist (team leader), tropical silviculturist, wildlife specialist, tropical forest soils expert, logging and transportation systems specialist, anthropologist/sociologist and watershed/hydrologist. This estimate is dependent upon the information available, its quality, the skills available in-country, the equipment available, the accessibility of the area, etc.

Illustrative List of Needs

This list illustrates potential data needed, though by no means all inclusive, to complete necessary analysis towards reaching sound decisions for natural resource management. The list is divided into four areas; physical biological, economic and social factors.

Physical Factors

1. Location.
2. Geomorphic/physiographic (geologic hazards, unique land forms).
3. Climate.
4. Soils (productivity, capability, hazard of erodibility and mass failure).
5. Minerals and energy resources.
6. Visual resources.
7. Cultural resources.
8. Water resources (water quality, streamflow regimes, flood plains, sensitive watersheds, wetlands, downstream uses, ground water recharge areas).
9. Air quality.
10. Fire (potential wildfire hazard, role of fire in the ecosystem).
11. Land use - including prime farm, timber and rangelands.
12. Infrastructure improvements (roads, trails, utility corridors and distribution, water collection, storage, distribution, manufacturing facilities, airports, heliports, communications systems, solid waste collection and disposal, sanitary waste collection and disposal).

Biological Factors

1. Forest (diversity of tree species, genetic diversity, silvics, physiology, growth and yield, seed production, regeneration).
2. Rangeland (conditions and trends).
3. Other major vegetation types.
4. Threatened or endangered plants and animal species (habitat needs of each).
5. Unique ecosystems.
6. Diversity of plant communities.
7. Noxious weeds.
8. Wildlife (habitat, populations, diversity of animal communities, animal damage control).
9. Fish (habitat, populations).
10. Recreation resources (usually a combination of physical and biological factors).
11. Insects and diseases.
12. Exotic organisms, especially these that have potential for adversely affecting management.

Economic Factors

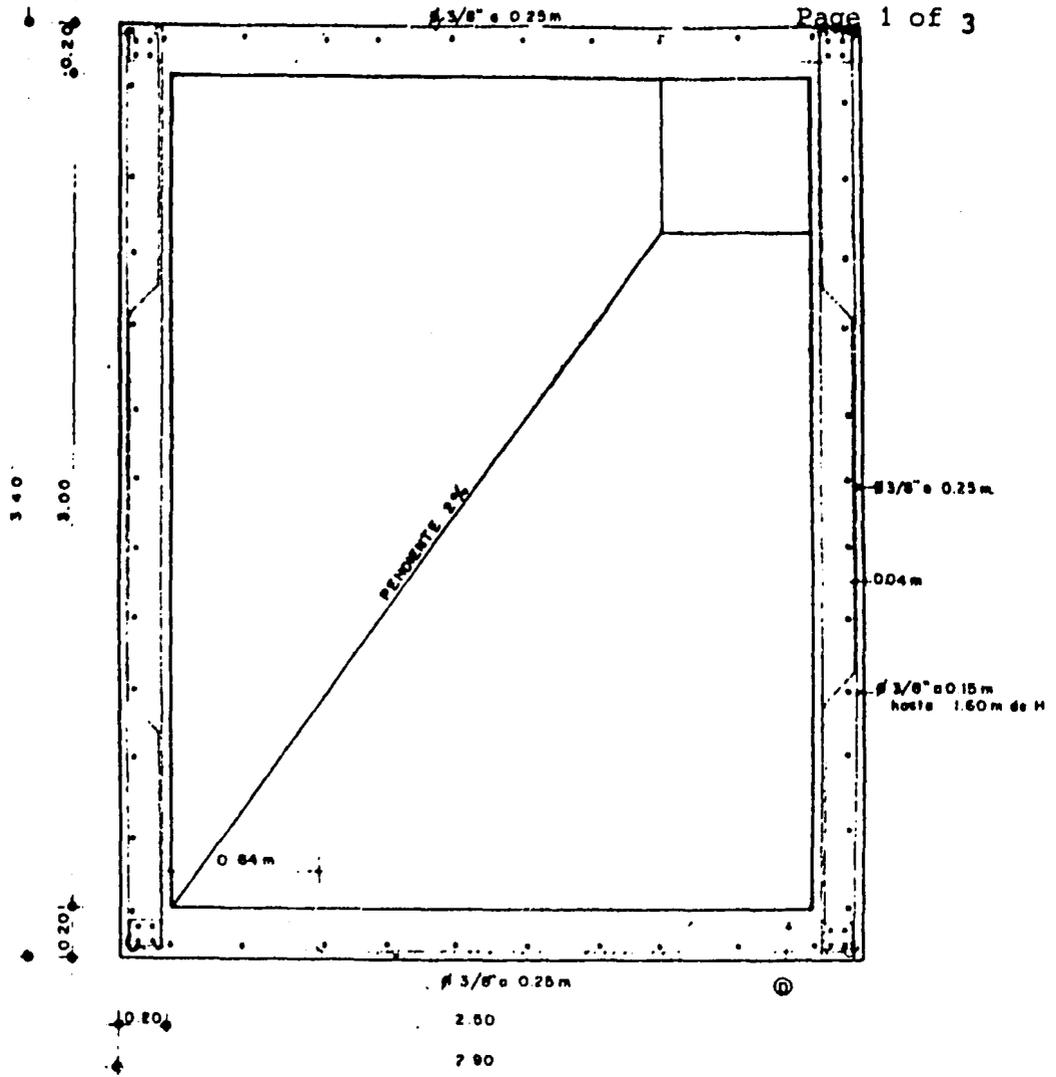
1. Economic base.
2. Employment/unemployment.
3. Housing.
4. Land use requirements.
5. Community service requirements.
6. Revenue base.
7. Plans and programs of other agencies.
8. Income (sources, amounts, distribution).
9. Cost (financial analysis).
10. Supply and demand (markets, import, export, regulations).

Area Selection Criteria for Public Forest Land	P o s s i b l e A r e a s *						
	Manabao	Sierra de Bahoruco	Savana de San Juan	Oviedo	El Palmar	Constanza	Restauración
1. Land area under public control by the DGF.	Partial	Most	Most	Mainly Private	Partial	Partially	Most
2. Land area with natural potential for one dominant wood tree species of high commercial product value and general use.	Mixed	Pine	Pine	Almacigo	Mixed	Pine	Pine
3. Land use potential primarily for forest resources.	Yes	Yes	Yes	-Agric. -Cotton -Sorghum -Forest	Yes	Yes	Yes
4. Land area sufficient to affect private development, conservation, foreign exchange earnings, employment, public forestry Development (Has.).	10,200	40,000	28,000	25,000	7,600	15,500	12,500

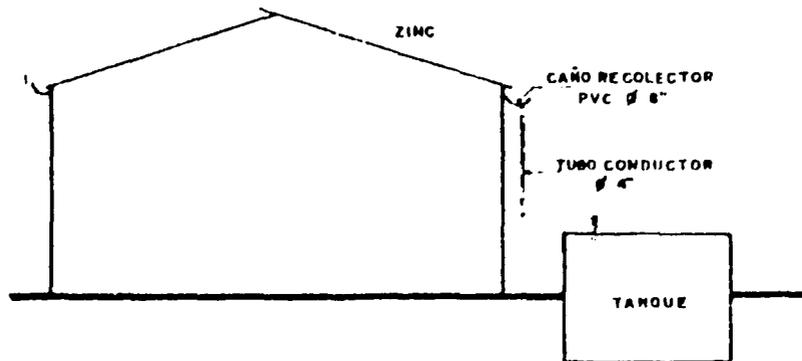
* Original areas selected by FAO intensive study, 1972.

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WATER STORAGE TANK



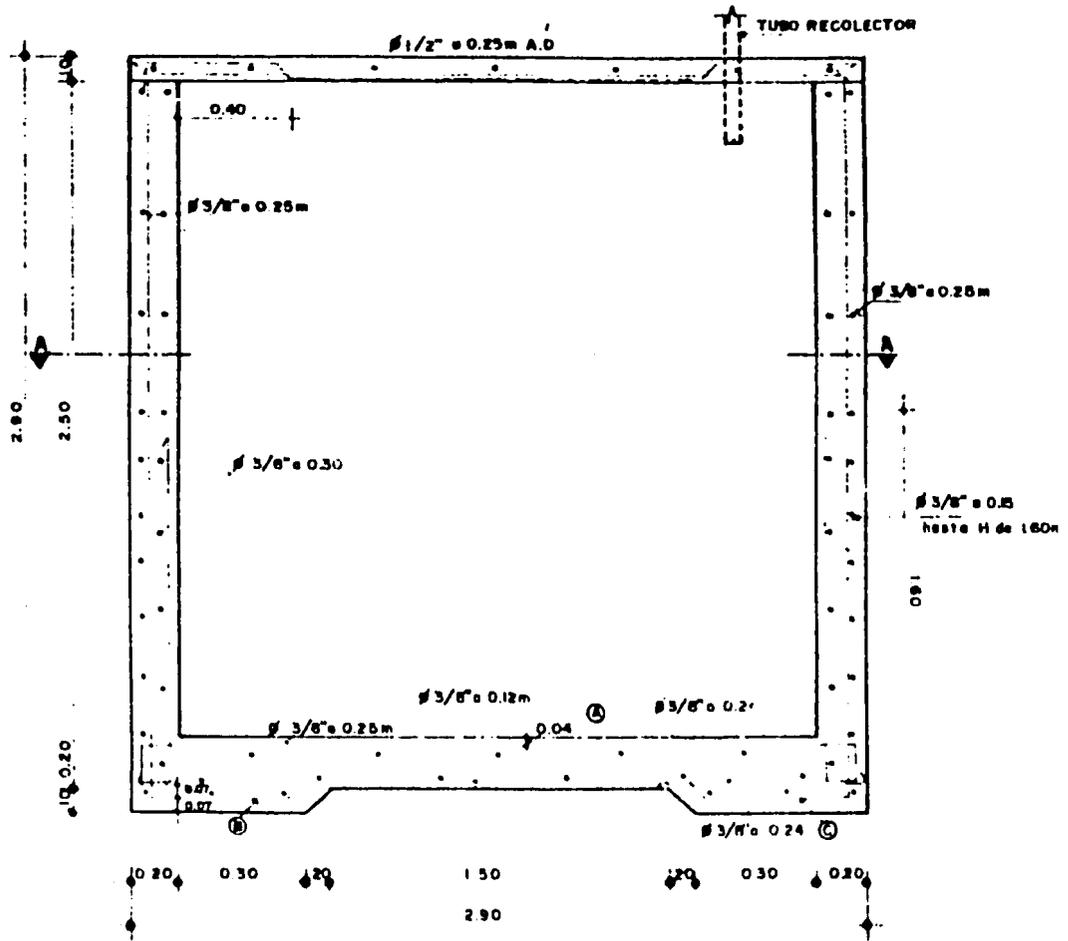
SECCION A-A



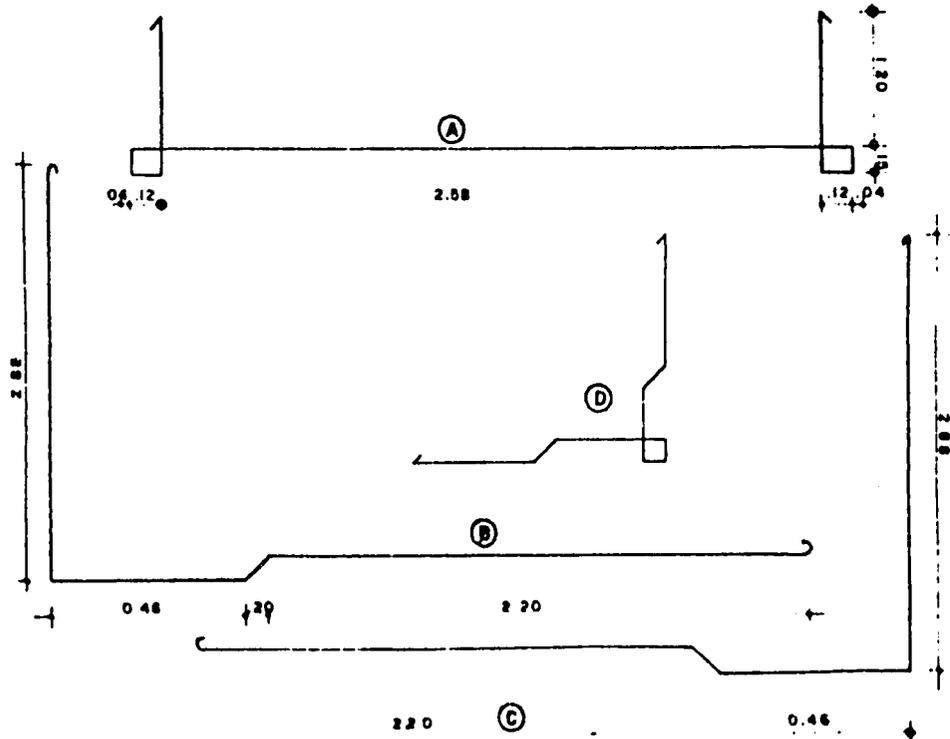
UBICACION DE TANQUE

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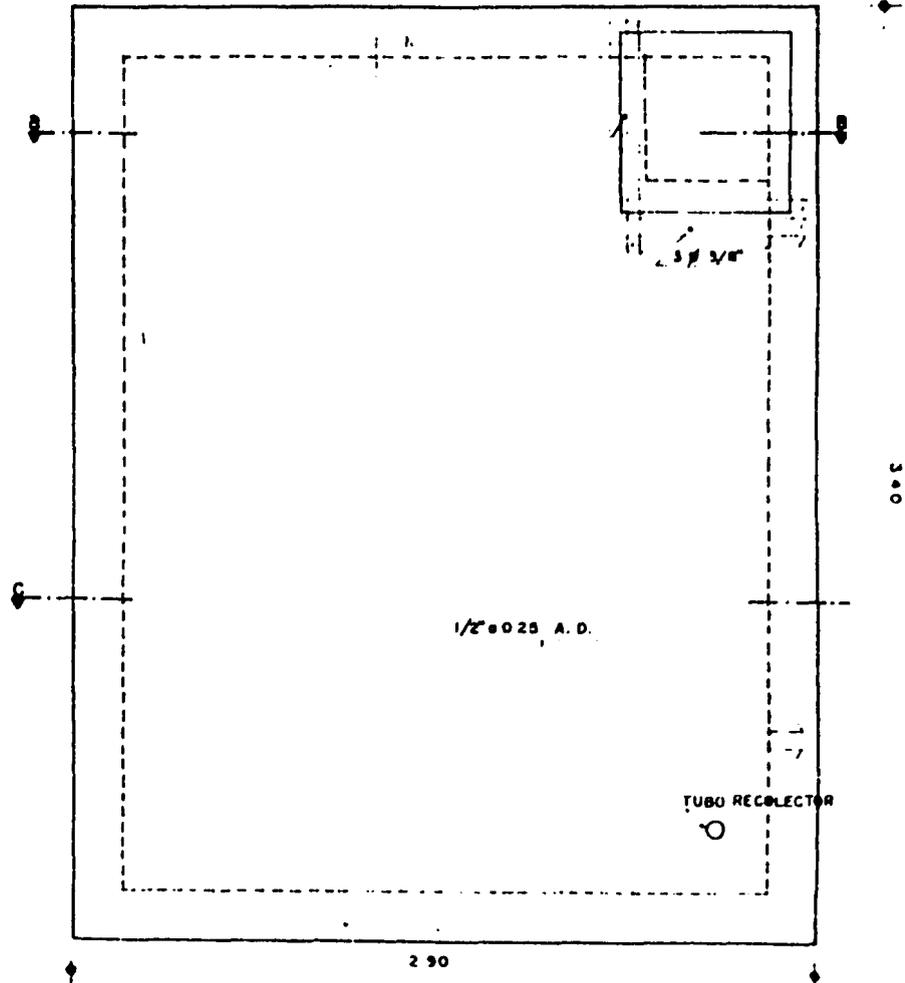
Water Storage Tank



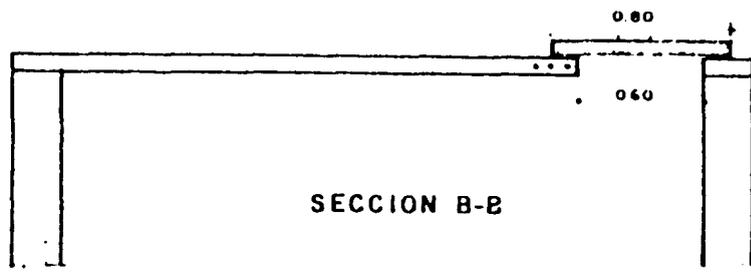
SECCION C-C



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LOSA SUPERIOR



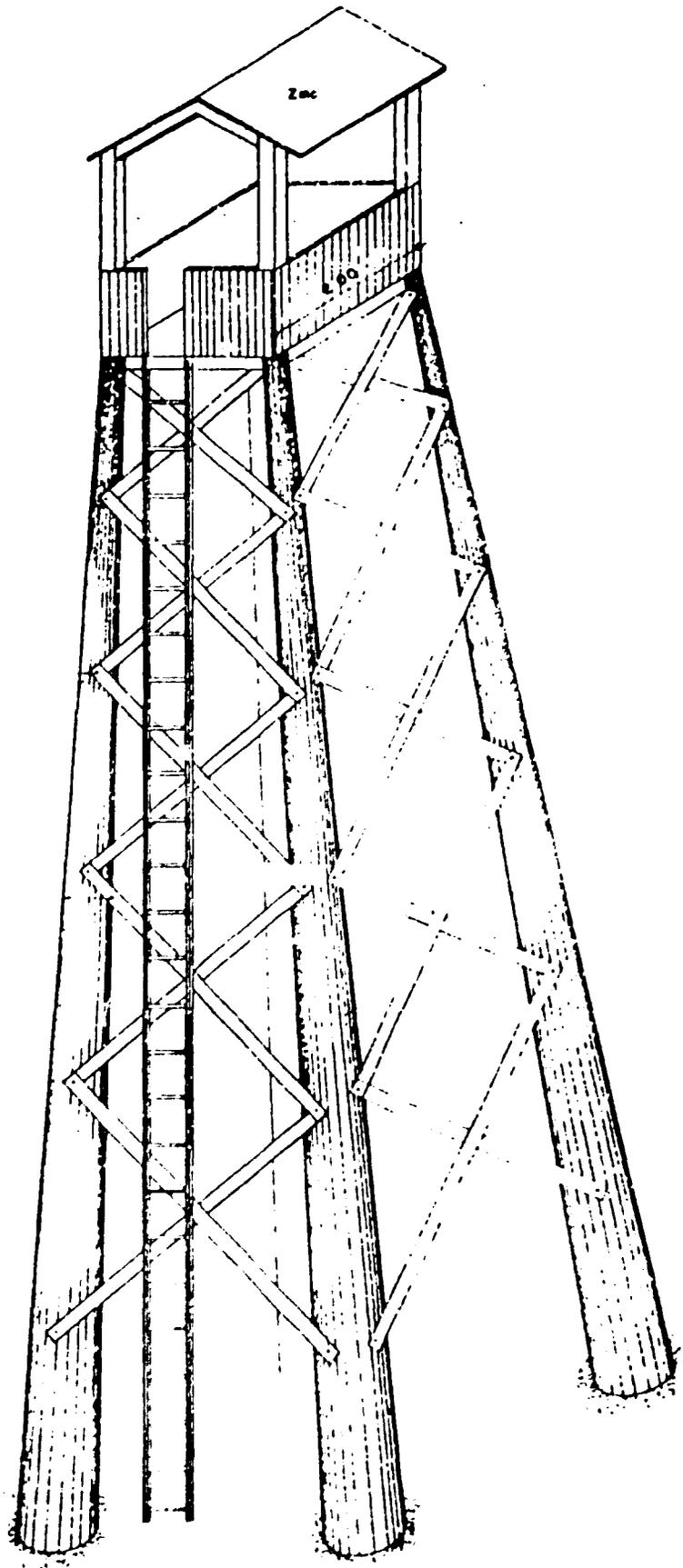
SECCION B-B

MATERIAL: HORMIGON ARMADO 1:2:4

CAPACIDAD: 5000 GALONES

ESCALA 1/20

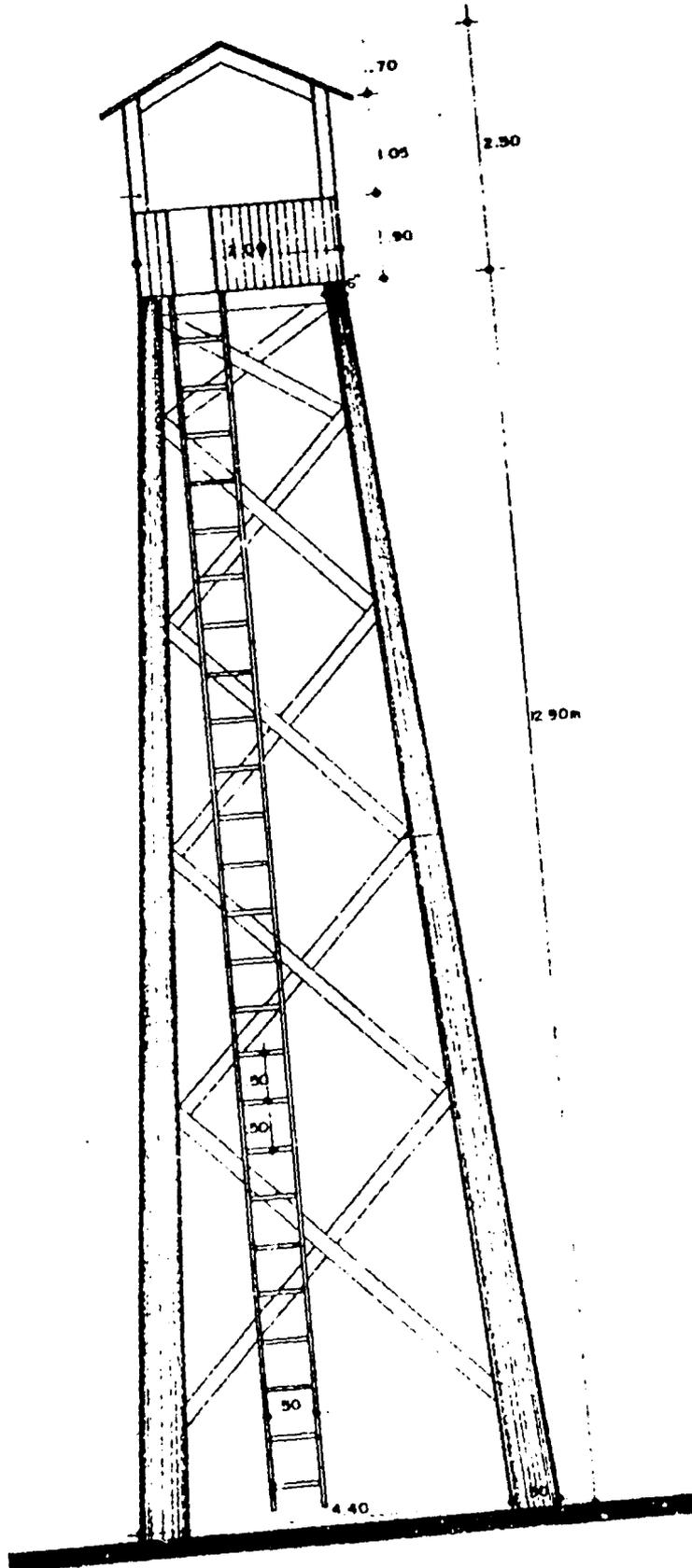
146



ISOMETRICA

Fire Control Look-Out Tower

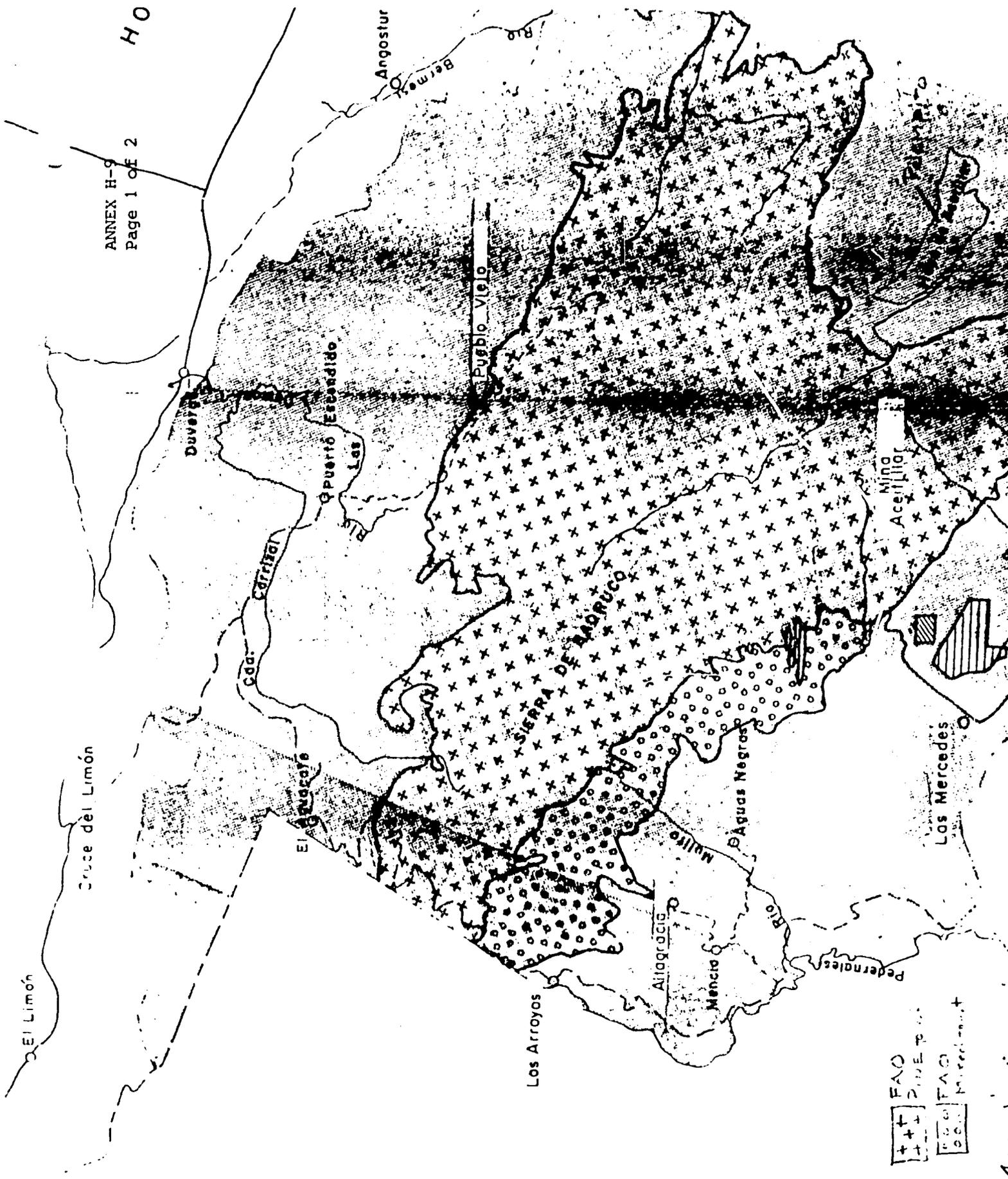
147



ELEVACION

FIRE CONTROL LOOK OUT TOWER

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REPUBLICA DE HAITI

+ + + + +
 FAO DURE P...
 + + + + +
 FAO M...

MAP No. 1

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HAITI

Laguna Limon

OAS

Ecologias 2

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Table 1 - Síntesis de los Datos de las Unidades de Producción

No. Area y Localización	Miles Has.	Volumen Anual Disponible Estimado	M ³ /Ha Ade- cuados para Aserraderos	Adecuados Sólo para Postes, Vigas y Aglomerado
1. S. de Bahoruco	40	50,000 M ³	30,000 M ³	20,000 M ³
2. Foresta seca Oviedo	25	(200,000 M ³)*	Tod@s residuos	No
3. San Juan	-	60,000 M ³	40,000 M ³	20,000 M ³
4. El Palmar	-	20,000 M ³	12,400 M ³	6,500 M ³
5. Nanabao	15	30,000 M ³ pinos 6,400 M ³ latifol.	20,000 M ³ 3,200 M ³	10,000 M ³ 3,200 M ³
6. San Jose de las Matas	2.7	5,400 M ³ pinos 4,000 M ³ latifol.	3,600 M ³ 2,000 M ³	1,800 M ³ 2,000 M ³
7. Constanza	20 -	26,000 M ³ pinos 12,000 M ³ latifol. <u>213,800 M³</u>	17,000 M ³ 6,000 M ³ <u>134,000 M³</u>	9,000 M ³ 6,000 M ³ <u>78,500 M³</u>
		42,500,000 pié	28,800,000	15,700,000

* Volumen no incluido en el total.

Source: Hore, 1970 and DGF, 1982.

TABLE 2

Natural Pine 2,100 Ha. Economic Analysis

	Year			
	1	2	3	4-20
	(Pesos)			
Costs				
Unskilled Labor:				
- Protection, Marking	26	28	29	28
- Harvest, Load	12	24	34	34
- Roads, Etc.	9	9	9	9
Administration, Supervision	18	23	26	26
Equipment:				
- Harvest	25	51	70	70
- Roads	44	7	21	13
- Transport	14	29	39	39
- Sawmill	34	69	95	95
Silviculture, Reforestation	294	294	294	294
Total Costs	476	534	617	608
Benefits				
- Sawnwood	421	842	1,160	1,160
- Posts, Poles	16	32	45	45
- Firewood	2	3	4	4
Total Benefits	439	877	1,209	1,209
Net Benefit (Cost)	-37	343	592	601
	EIRR	=	50%	
Foregone Profits (Land OC)	210	210	210	210
Incremental Net Benefit	-247	133	382	391
Incremental		EIRR	=	50%

Annex Table 3 Natural Pine 2100ha, Financial Analysis

	Year:							
	1	2	3	4	5	6	7	8-20
	← (pesos) →							
Costs								
Unskilled labor	79	103	122	120	120	120	120	120
Admin. Superv	18	23	26	26	26	26	26	26
Equipment								
Harvest	25	51	70	70	70	70	70	70
Foos	44	7	21	13	13	13	13	13
Transport	14	29	39	39	39	39	39	39
Sawmill	34	69	95	95	95	95	95	95
Silvi, refor	294	294	294	294	294	294	294	294
Loan repay			103	103	103	103	103	
Total costs	508	576	770	760	760	760	760	657
Benefits								
Sale	421	842	1160	1160	1160	1160	1160	1160
Poste, poles	16	32	45	45	45	45	45	45
Firewood	2	3	4	4	4	4	4	4
Loan proceeds	381							
Total benefits	820	877	1209	1209	1209	1209	1209	1209
Net benefit (cost)	312	301	439	449	449	449	449	552
		EIRR = 50%						
Foregone profits (land OC)	210	210	210	210	210	210	210	210
Incremental Net Benefit	102	91	229	239	239	239	239	342
		Incremental EIRR = 50%						

Notes:

Labor priced at RD\$6.75 per day

Loan interest is 11%, 2 year grace on payment, 5 year payback period

See Table 1 for other assumptions

Table 4 Private Pine 10ha., Economic Analysis

	Year:																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	(pesos)																			
Costs																				
Site prep	720																			
Plant	320																			
Replant	40																			
Clean		40	40	40																
Maintenance		40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Seedlings	1700																			
Fertilizer	300																			
Thin, harvest								210				105					1845			8010
Extension/OH	30	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Total costs	3110	96	96	96	56	56	56	266	56	56	56	161	56	56	56	56	1901	56	56	8066
Benefits																				
Thinning								1820				910					930			1860
Sawlogs																	17400			80100
Total benefits	0	1820	0	0	0	910	0	0	0	0	18330	0	0	81960						
Net benefit (cost)	3110	96	96	96	56	56	56	1554	56	56	56	749	56	56	56	56	16429	56	56	73894
EIRR = 0.206																				
Foregone profits(landOC)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Incremental Net Benefit	4100	1096	1096	1096	1056	1056	1056	554	1056	1056	1056	251	1056	1056	1056	1056	15429	1056	1056	72894
Incremental EIRR = 0.122																				

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Annex Table 4-A Private Pine 10ha, Financial Analysis

	Year:																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(pesos)																				
Costs																				
Site prep	1217																			
Plant	540																			
Replant	68																			
Clean		68	68	68																
Maintenance		68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
Seedlings	1700																			
Fertilizer	300																			
Thin, harvest								255				177					3118			13537
Loan Repay																	10000			1854
Total Costs	3525	136	136	136	68	68	68	323	68	68	68	245	68	68	68	68	13186	68	68	11751
Benefits																				
Thinning								1820				910					930			1860
Sawlogs																	17400			80100
Loan Proceeds	2869																			
Total Benefits	2869	0	0	0	0	0	0	1820	0	0	0	910	0	0	0	0	18330	0	0	81960
Net Benefit (cost)	956	136	136	136	68	68	68	1497	68	68	68	665	68	68	68	68	5144	68	68	70109
FIRR=	0.261																			
Foregone Profit (land)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Incremental Net Benefit	1956	1136	1136	1136	1068	1068	1068	497	1068	1068	1068	335	1068	1068	1068	1068	4144	1068	1068	69209
Incremental FIRR=	0.119																			

Notes: Labor at \$6.75/day
 Stumpage at \$69 m³
 Loan interest is 11% on 75% of costs
 See Table 2 for other assumptions

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PROYECTO DE FINCA ENERGETICA
RESUMEN Y CONCLUSIONES FINANCIERAS

ANNEX I- 5
Page 1 of 2

TABLE 4

1. Area de Plantación: 1,000 hectáreas (16,000 tareas)
2. Ubicación: El Valle de Sabana de la Mar y Otras Areas Similares
3. Especie: Eucalyptus ssp.
4. Programación de la Siembra:
 - a) Primera Etapa (Año 1): 500 hectáreas (8,000 tareas)
 - b) Segunda Etapa (Año 2): 500 hectáreas (8,000 tareas)
5. Rendimientos Estimados:
 - a) Primer Corte (Años 1 - 6) : 40 Mts.³ de Leña/Hectárea/Año
 - b) Segundo Corte (Años 7 - 12): 35 Mts.³ de Leña/Hectárea/Año
 - c) Tercer Corte (Años 12 - 17): 35 Mts.³ de Leña/Hectárea/Año
6. Ciclo de Vida del Proyecto: 17 Años (Tres Cosechas Económicas)
7. Producto Final: Carbón Vegetal; Precio RD\$6.00/CQ.
8. Costo Directo de Establecimiento de la Plantación:
 - a) RD\$504.00/Hectárea/Año
 - b) RD\$ 31.53/Tarea/Año
9. Inversión Total Primeros Seis (6) Años:
 - a) Financiada RD\$2,051,400 (61%)
 - b) Accionaria 1,322,023 (39%)

Total RD\$3,373,423
10. Aportes Propios (Capital Accionario)
 - a) Primer Año RD\$217,400
 - b) Segundo Año 234,400
 - c) Tercer Año 228,500
 - d) Cuarto Año 228,500
 - e) Quinto Año 228,500
 - f) Sexto Año 184,723

Total RD\$1,322,023

11. Condiciones del Préstamo:

- a) Interés: 9%
- b) Período de Gracia: Seis (6) Años
- c) Amortización: Dos (2) Años

12. Clasificación de las Inversiones:

- a) RD\$3,286,923 (97.4%)
- b) US\$ 86,500 (2.6%)

13. Evaluación Financiera

13.1. Tasa Interna de Retorno

- a) Sobre la Inversión Total Penalizada: 20.0%
- b) Sobre la Inversión Total Sin Penalizar: 23.88%
- c) Sobre la Inversión Propia: 28.40%

13.2. Valor Actual Neto

- a) Sobre el Proyecto Total: RD\$2,398,299

13.3. Razón Beneficio/Costo

- a) Sobre el Proyecto Total: 1.43

13.4. Período de Pago

- a) Sobre el Proyecto Total: 6.95 Años

14. Evaluación Socio-Económica

Tasa Social de Rentabilidad: 36.82%

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July 27, 1984

Mixed Pine/Fuelwood 38ha, Economic Analysis

	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
----- (posos) -----																					
Costs																					
Inputs	0.9	5276	3170	4134	3597	2357	2117	2999	3974	2999	2999	2999	3128	197	3839	3939	3964	3839	3839	3839	8029
Extension/CH		104	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Total Costs		5380	3230	4194	3657	2417	2177	3059	4034	3059	3059	3059	3188	257	3899	3899	4024	3899	3899	3899	8089
Benefits																					
Wood, logs, posts	1.35	0	0	0	0	0	0	13982	24098	13973	13973	13973	28148	10125	13973	13973	28148	24098	13973	24098	33622
Total Benefits		0	0	0	0	0	0	13982	24098	13973	13973	13973	28148	10125	13973	13973	28148	24098	13973	14098	33622
Net Benefit (costs)		5380	3230	4194	3657	2417	2177	10923	20064	10914	10914	10914	24960	9868	10074	10074	24124	20199	10074	20199	25533
EIRR =		0.285																			
Foregone Profits (land OC)		3800	3800	3800	3800	3800	3800	3800	3800	3800	3800	3800	3600	3800							
		9180	7030	7994	7457	6217	5977	7123	16264	7114	7114	7114	21160	6068	6274	6274	20324	16399	6274	16399	21733
Incremental EIRR =		0.141																			

Notes: Labor at \$4/day
Stumpage at \$69 m³

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July 27, 1984

Mixed Pine/Fuelwood 38ha, Financial Analysis

	Year																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	(pesos)																				
Costs																					
(Orig Analysis)		5862	3522	4593	3997	2619	2352	3332	4415	3332	3332	3332	3475	219	4265	4265	4404	4265	4265	4265	8921
Inputs	0.9	5276	3170	4134	3597	2357	2117	2999	3974	2999	2999	2999	3128	197	3839	3839	3964	3839	3839	3839	8029
Loan Repay									1071	1714	2553	3263	3761	3169	2525	1667	957	478			
Total Costs		5276	3170	4134	3597	2357	2117	2999	5044	4713	5551	6281	6889	3366	6364	5525	4920	4317	3839	3838	8029
Benefits																					
(Orig. Analysis)		0	0	0	0	0	0	10357	17850	10350	10350	10350	20850	7500	10350	10350	20850	17850	10350	17850	24905
Wood, logs, pos	1.35	0	0	0	0	0	0	13982	24098	13973	13973	13973	28148	10125	13973	13973	28148	24098	13973	24098	33622
Loan Proceeds		3957	2377	3100	2698	1768	1588														
Total Benefits		3957	2377	3100	2698	1768	1588	13982	24098	13973	13973	13973	28148	10125	13973	13973	28148	24098	13973	24098	33622
Net Benefit (cost)		1319	792	1033	899	589	529	10983	19053	9260	8421	7691	21259	6759	7609	8447	23227	19781	10134	20259	25593
FIRR =		0.539																			
Foregone Profits (land OC)		3800	3800	3800	3800	3800	3800	3800	3800	3800	3800	3900	3800	3800	3800	3600	3800	3800	3800	3800	3800
Incremental Net Benefit		5119	4592	4833	4699	4369	4329	7183	15253	5460	4621	3891	17459	2959	3809	4647	19427	15981	6334	16459	21793
Incremental FIRR =		0.182																			

Notes: Hired Labor at \$6.75/day
 Stumpage at \$69 m³
 Loan interest is 11% on 75% of cost

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7. Credit Cash Flow (75% Financing)

(In KSh)

Fuelwood Production
(3,000 Hectare)

YR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	15-25
Production ^{b)}	274,932.00	274,932.00	274,932.00	274,932.00	274,932.00											
Maintenance	148,320.00	148,320.00	148,320.00	148,320.00	148,320.00											
Net	-	-	-	-	-	10,800.00	10,800.00	10,800.00	10,800.00	10,800.00						
Total	423,252.00	423,252.00	423,252.00	423,252.00	423,252.00	10,800.00										

Recovery^{c)}

Wood Production (Poles)
(2,500 Hectare) a)

Production ^{b)}	131,760.00	131,760.00	131,760.00	131,760.00												
Maintenance ^{c)}	111,506.25	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00	114,318.00
Net	-	-	-	-	-	-	-	-	-	-	10,800.00	10,800.00	10,800.00	10,800.00	10,800.00	10,800.00
Total	243,266.25	246,078.75	246,078.75	246,078.75	114,318.75	114,318.75					125,118.75					
											250,262.09					

Wood Production (Lumber)
(2,000 Hectare) a)

Production ^{b)}	105,408.00	105,408.00	105,408.00	105,408.00	105,408.00											
Maintenance ^{c)}	89,205.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00	91,455.00
Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	194,613.00	196,863.00	196,863.00	196,863.00	196,863.00											

Recovery^{c) d)}

Net	861,121.25	863,193.00	863,193.00	863,193.00	863,193.00											
Loan Recovery						430,447.28	430,447.00	430,447.28	430,447.00	680,709.37	250,262.09	250,262.09	250,262.09	250,262.09	250,262.00	

1/5 of the total area will be planted each year in a five year period
 Cost of seedling - KSh 0.13
 Planting cost - KSh 0.05
 Assume a 10% delinquency

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Financial Plan by Activity

Activity Comprehensive Inventory

1000

Inputs

Loan Loan

FX. LC. Grant

GODR

TOTAL

Technical Assistance

Long term

Shot term

50 50

Personnel

40 40

Vehicles

10 10

Vehicles Spare Parts

Equipment and Materials

50

50

Cartographic Equipment

50

50

Operating Costs

20 20

Rent and Utilities

5 5

Travel, Local

Vehicle Operating Costs

15 15

Supplies

TOTAL

50

70

120

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Financial Plan by Activity

Activity Management Plan Development

Inputs	1000			GODR	TOTAL
	Loan	Loan	Grant		
Technical Assistance			<u>24</u>		<u>24</u>
Long term					
Short term 2 persons - months x \$12.			24		24
Personnel				<u>122</u>	<u>122</u>
				122	122
Vehicles			<u>30</u>		<u>30</u>
2 pick-ups x \$15,000			30		30
Vehicles Spare Parts			<u>15</u>		<u>15</u>
			15		15
Equipment and Materials			<u>90</u>		<u>95</u>
Forestry Equipment			50		50
Drafting "			15	5	20
Microcomputer			25		25
Operating Costs				<u>40</u>	<u>148</u>
Rent and Utilities				30	30
Travel, Local				38	38
Vehicle Operating Costs			20	10	30
Supplies and Publications			20	70	90
TOTAL	<u>135</u>	<u>45</u>	<u>24</u>	<u>270</u>	<u>474</u>

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Financial Plan by Activity

Activity Public Forest Land Demarcation

<u>Inputs</u>	Loan		Grant	GODR	TOTAL
	FX.	LC.			
Technical Assistance			<u>36</u>		<u>36</u>
Long term					
Short term 3 persons - months x \$12.			36		36
Personnel					
Personnel				<u>50</u>	<u>50</u>
					50
Vehicles	<u>30</u>				<u>30</u>
2 Pick-ups x \$15,000	30				30
Vehicles Spare Parts	<u>15</u>				<u>15</u>
	15				15
Equipment and Materials	<u>25</u>	<u>20</u>		<u>35</u>	<u>80</u>
Survey Equipment	25				25
Tools and Marking Materials				35	35
Office Equipment and Materials		20			20
Operating Costs		<u>20</u>		<u>155</u>	<u>175</u>
Rent and Utilities				40	40
Travel, Local				30	30
Vehicle Operating Costs		20		10	30
Supplies				75	75
Services				400	400
TOTAL	<u>70</u>	<u>40</u>	<u>36</u>	<u>640</u>	<u>786</u>

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Financial Plan by Activity

Activity	Sub-District Office Support			GODR	TOTAL
	1000				
Inputs	Loan FK.	Loan LC.	Grant		
Technical Assistance					
Long term					
Short term				66	66
Personnel				66	66
Vehicles	64				64
2 Pick-ups \$15,000	30				30
2 4 WD x \$15,000	30				30
4 Motorcycles x \$1,000	4				4
Vehicles Spare Parts	24				24
	24				24
Equipment and Materials	12	6			18
2 Radio sets x \$2.2 - Accessories	5				5
Office/house equipment	7	6			13
Operating Costs		76		108	184
Rent and Utilities				60	60
Travel, Local					
Vehicle Operating Costs		40		8	48
Supplies		36		40	76
TOTAL	100	82		174	356

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Financial Plan by Activity

Activity Management Plan Implementation

<u>Inputs</u>	1000			GODR	TOTAL
	Loan FK.	Loan LC.	Grant		
Technical Assistance					
Long term					
Short term 5 persons - month x \$12			60		60
Personnel				938	938
Vehicles	<u>514</u>				<u>514</u>
2 Bulldozers \$125,000	250				250
2 Graders x \$80,000	160				160
2 Tractors x \$25,000	50				50
2 Trucks - (Dump) x \$25,000	50				50
4 Motorcycles x \$1,000	4				4
Vehicles Spare Parts	<u>259</u>				<u>259</u>
Equipment and Materials	<u>35</u>	48		250	<u>333</u>
8 Radio Sets x 2.2 and Accessories	20				20
2 Water Pumps - Parts	15				15
Tools				250	
Irrigation Systems		48			48
Operating Costs		<u>170</u>		<u>188</u>	<u>358</u>
Rent and Utilities				20	20
Travel, Local				24	24
Vehicle Operating Costs		170		144	314
Supplies					
Infrastructure					
Services and Materials	255			380	635
TOTAL	1063	218	60	1756	3097

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Financial Plan by Activity

Activity	Fire Control			GODR	TOTAL
	1000				
<u>Inputs</u>	Loan FX.	Loan LC.	Grant		
Technical Assistance			<u>36</u>		<u>36</u>
Long term					
Short term 3 persons-months x 12.			36		36
Personnel				<u>60</u>	<u>60</u>
				60	60
Vehicles	<u>105</u>				<u>105</u>
1 4 WD x \$15,000	15				15
6 Pick-ups x \$15,000	90				90
Vehicles Spare Parts	<u>65</u>				<u>65</u>
	65				65
Equipment and Materials	<u>165</u>	<u>38</u>			<u>203</u>
Radio Comm. 20x2.2= 44-\$6. Parts	50				50
Fire Control Equipment	85	32			117
Office Equipment and Materials		6			6
Water Supply Equipment - Parts	30				30
Operating Costs		<u>152</u>		<u>60</u>	<u>212</u>
Rent and Utilities				<u>10</u>	<u>10</u>
Travel, Local				10	10
Vehicle Operating Costs		122		20	142
Supplies		30		20	50
Infrastructure		<u>30</u>		<u>70</u>	<u>100</u>
10 Look out Towers		15		45	60
10 Water Storages Cisterns		15		25	40
TOTAL	335	220	36	190	781

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Financial Plan by Activity

Activity	Forest Research			GODR	TOTAL
	1000				
<u>Inputs</u>	Loan FX.	Loan LC.	Grant		
Technical Assistance			240		240
Long term 25 persons-months x 10.			240		240
Personnel				248	248
				248	248
Vehicles	36				36
2 Pick-ups x \$15,000	30				30
6 Motorcycles x \$1,000	6				6
Vehicles Spare Parts	18				18
	18				18
Equipment and Materials	60	3			63
Research Equipment and Materials	60				60
Office Equipment		3			3
Operating Costs		41		88	129
Rent and Utilities				20	20
Travel, Local				14	14
Vehicles Operating Costs		24		24	48
Supplies		17			17
Publication				30	30
TOTAL	114	44	240	336	734

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Financial Plan by Activity

Activity	Extension			GODR	TOTAL
	Loan FX.	Loan LC.	Grant		
<u>Inputs</u>					
Technical Assistance			240		240
Long term 24 persons-months x \$10.			240		240
Short term				108	108
Personnel				108	108
Vehicles	40				40
2 Pick-ups x \$15,000	30				30
10 Motorcycle x \$1,000	10				10
Vehicles Spare Parts	20				20
Equipment and Materials	172	15			187
Audio Visual Equipment	125				125
Office Equipment	7				7
Materials	40	15			55
Operating Costs		100		49	149
Rent and Utilities				2	2
Travel and Utilities				17	17
Vehicle Operating Costs		65		10	75
Supplies		35		20	55
TOTAL	232	115	240	157	744

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Financial Plan by Activity

Activity Market Analysis and Development

<u>Inputs</u>	<u>.000</u>			GODR	TOTAL
	A I D Loan FX.	Loan LC.	Grant		
Technical Assistance					60
Long term					
Short term 5 persons-months x \$12.			60		60
Personnel				<u>36</u>	<u>36</u>
Vehicles					
Vehicles Parts					
Equipment and Materials					
Operating Costs				<u>24</u>	<u>24</u>
Rent and Utilities					
Travel, Local					
Vehicle Operating Costs					
Supplies				24	24
Technical Services	<u>75</u>	<u>75</u>		<u>114</u>	<u>264</u>
TOTAL	75	75	60	174	384

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Financial Plan by Activity

Activity	Credit Fund				
	1000				
<u>Inputs</u>	Loan	Loan			
	FX.	LC.	Grant	GODR	TOTAL
Technical Assistance					
Long term			24		24
Short term persons-months x 12.			24		24
Personnel					
Vehicles	30				30
2 4 WD x \$15,000	30				30
Vehicles Spare Parts	15				15
	15				15
Equipment and Materials					
Operating Costs					
Rent and Utilities					
Travel, Local					
Vehicle Operating		15		15	30
Supplies					
Infrastructure					
Credit Fund				5,000	
TOTAL	45	15	24	5,015	5,099

Financial Plan by Activity

Activity Organization and Management

 1000

Inputs	Loan FX	Loan LC	Grant	<u>GODR</u>	Total
Technical Assistance			<u>900</u>		<u>900</u>
Long term 90 person-months x \$10,			900		900
Personnel				<u>400</u>	<u>400</u>
				400	400
TOTAL			900	400	1,300

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Financial Plan by Activity

Activity Personnel and Training1000

Inputs	Loan FX	Loan LC	GODR	Total
Training		<u>870</u>	<u>770</u>	<u>1640</u>
5 M.S. x \$40,000 (2 yrs)		200		200
15 B.S. x \$25,000 (5 yrs)		375		375
10 Dasónomos (Esnacifor) x \$13,500 3 yrs.		135		135
60 Forestry Technician (DR) x \$10,000		100	500	600
240 Vigilantes (DR) x \$1,250		60	240	300
200 Farmer participants short courses and field days			30	30
Total		<u>870</u>	<u>770</u>	<u>1640</u>

Financial Plan by Activity

Activity Facilities and Equipment

_____1000_____

Inputs

	Loan FX	Loan LC	GODR	Total
Vehicles	<u>76</u>			<u>76</u>
5 4 WD x \$15,000	75			75
1 Motorcycle x \$1,000	1			1
	<u>38</u>			<u>38</u>
Vehicles Spare Parts	38			38
Equipment and Materials	<u>57</u>	<u>108</u>	<u>561</u>	<u>726</u>
Radio Comm. 10x2.2= H3. (Parts)	25			25
Computer and Software	25			25
Office Equipment and Materials	7	44	51	102
Construction Materials		64	510	574
Operating Costs				
Rent and Utilities		<u>75</u>	<u>42</u>	<u>117</u>
Travel, Local			32	32
Vehicles Operating Costs		75	10	85
Supplies				
Total	171	183	603	957