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AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D.C. 20523

PROJECT PAPER

PAKISTAN

FORESTRY PLANNING AND DEVELOPMENT

(391-0481)

AUGUST 1983

UNCLASSIFIED

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

PROJECT AUTHORIZATION

PAKISTAN

Forestry Planning and Development
Project No. 391-0481

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Forestry Planning and Development Project for the Islamic Republic of Pakistan (the "Cooperating Country") involving planned obligations of not to exceed U.S. dollars Twenty-Five Million ($25,000,000) in grant funds over a four (4) year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project.

2. The Project is designed to increase Pakistan's energy self-sufficiency and to reduce deforestation by assisting the Cooperating Country to formulate and implement plans and programs to assess, develop, and use Pakistan's indigenous forest and fuelwood resources and to increase the efficiency of their production and use. This will be accomplished by, among other things, strengthening the capability of the Cooperating Country to: (a) undertake effective integrated and provincial analyses of forest and fuelwood development strategies in order to support financially sound forest and fuelwood policy development and planning; (b) develop and implement programs to encourage farm and energy forestry, primarily on private lands; and (c) develop and conduct a program of research to design and evaluate on-farm tree crop management strategies that enhance the production of conventional agricultural crops while producing fuelwood, fodder, and timber.

3. The Project Agreement(s) which may be negotiated and executed by the officer(s) 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. Source and Origin of Goods and Services

Goods and services financed by A.I.D. under this Project shall have their source and origin in the Cooperating Country or in the United States, 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 United States and the Cooperating Country.

b. Conditions Precedent to Initial Disbursement for Farm and Energy Forestry Field Operations

Except as A.I.D. may otherwise agree in writing, prior to the disbursement of funds for activities under the Farm and Energy Forestry Field Operations component of this project other than for technical assistance, vehicles, household/office furniture, and other equipment for technicians, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Cooperating Country, acting through its Ministry of Food, Agriculture and Cooperatives, shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D., documentary evidence that:

i. an administrative unit has been authorized and established within the Ministry of Food, Agriculture and Cooperatives to manage all project component activities; the authorities, duties and responsibilities of the overall manager for the administrative unit have been adequately defined; an adequately trained and experienced overall manager of the administrative unit has been appointed; and sufficient support staff have been appointed to enable the manager to carry out his duties effectively;

ii. a unit within the Pakistan Forest Institute has been authorized, established, and adequately staffed to assume responsibility for designing and implementing professional curricula for farm and energy forestry;

iii. a management system has been developed to identify, select, approve, implement, monitor and certify completion of Farm and Energy Forestry Field activities; and,

iv. the mechanisms by which A.I.D. will fund Farm and Energy Forestry Field activities have been jointly agreed to.

c. Conditions Precedent to Initial Disbursement for Activities under the Farm and Energy Forestry Field Operations Component in a Specific Province

Except as A.I.D. may otherwise agree in writing, prior to any disbursement for activities in a specific province pursuant to the Farm and Energy Forestry Field Operations component of this project, other than for technical assistance,

vehicles, household/office furniture, and other equipment for technicians, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Cooperating Country, acting through its Ministry of Food, Agriculture and Cooperatives, shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D. documentary evidence that:

i. an administrative unit has been authorized and established within the Forest Department for that Province for which the disbursement is sought to manage all project component activities within the Province; the authorities, duties and responsibilities of the overall manager for that administrative unit have been adequately defined; an adequately trained and experienced overall manager has been appointed for that unit; and sufficient support staff have been appointed to enable the manager to carry out his duties effectively; and,

ii. a plan of training, acceptable to A.I.D., including a schedule of training adequate to provide the staff skills needed for the project, has been authorized and approved by the Provincial Government for that Province for which the disbursement is sought and individuals have been identified for each training slot for the 12 months following the date of authorization and approval of said plan and schedule.

d. Covenants as to the Establishment of a Federal Advisory Committee for Farm and Energy Forestry

The Cooperating Country shall assure that a Federal Advisory Committee for Farm and Energy Forestry is established, holds regularly scheduled meetings, and serves as a review and advisory body for overall implementation of the project. This committee shall include, at a minimum, representatives of the Ministries of Food, Agriculture, and Cooperatives, Planning and Development, and Petroleum and Natural Resources and of each of the Provinces.

e. Covenant as to Monitoring and Evaluation

The Cooperating Country shall, in furtherance of adequate monitoring and evaluation:

i. carry out a scheduled monitoring program acceptable to A.I.D. which shall include periodic site visits to ensure the proper implementation of various project elements;

ii. provide A.I.D. with copies of all internal monitoring information and written reports of all review activities; and

iii. provide for the designated Federal and Provincial project directors, the A.I.D. Project Officer, the Technical Assistance Team Leader, and others as appropriate, to hold periodic review meetings for the purpose of evaluating project progress and requirements.

f. Covenant as to External Evaluation

The Cooperating Country shall participate in periodic external project evaluations by assigning senior representatives of participating ministries and agencies to joint A.I.D.-Cooperating Country Evaluation Teams.

g. Covenant as to Participant Training

The Cooperating Country, acting through its Federal Ministry of Food, Agriculture and Cooperatives, and each of the participating provinces in the project, shall make every reasonable effort to require that each person trained under this project works in activities related to farm and energy forestry in Pakistan for not less than three times the length of time of his or her training program; provided, however, that in no event shall the individual be allowed to work in farm and energy forestry activities for less than one year nor be required to work in farm and energy forestry activities for more than five years from the date of the individual's completion of training.

h. Covenant as to Farm Forestry Initiatives

The Cooperating Country shall examine strategies to limit grazing on afforested lands, to ensure adequate tree crop management on private farm land, and encourage reafforestation after the harvest. The Cooperating Country shall provide written reports to A.I.D. describing progress in these areas every 24 months from the date of the signing of this Agreement.

i. Covenant as to Maintenance of Project Equipment, Vehicles, and Commodities

The Cooperating Country shall ensure adequate maintenance for all heavy equipment, vehicles, and durable commodities for the project and provide a periodic training program for equipment operators and maintenance personnel. The

Cooperating Country shall provide written reports to A.I.D. describing its actions in these areas every 24 months from the date of the signing of this Agreement.

Signature _____
M. Peter McPherson
Administrator

Aug 11, 1983
Date

Clearance:	Date	Initial
Charles W. Greenleaf, AA/ASIA	CG	8/9
Richard A. Derham, A/AA/PPC	8/16	[illegible]
Richard A. Derham, GC	8/16	[illegible]

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

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

DOCUMENT CODE

2. COUNTRY/ENTITY: Pakistan

3. PROJECT NUMBER: 391-0481

4. BUREAU/OFFICE: Bureau for Asia ASIA 04

5. PROJECT TITLE (maximum 40 characters): Forestry Planning and Development

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 91

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 83 B. Quarter 4 C. Final FY 86

8. COSTS ($000 OR EQUIVALENT $1 = Rs 12.83)

A. FUNDING SOURCE	FIRST FY 83 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	4,300	2,700	7,000	9,846	15,154	25,000
(Grant)	(4,300)	(2,700)	(7,000)	(9,846)	(15,154)	(25,000)
(Loan)	(-)	(-)	(-)	(-)	(-)	(-)
Other U.S. 1.						
Other U.S. 2.						
Host Country	-	205	205	-	14,300	14,300
Other Donor(s)						
TOTALS	4,300	2,905	7,205	9,846	29,454	39,300

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ESF	740	160	-	-	-	25,000	-	25,000	-
(2)									
(3)									
(4)									
TOTALS				-	-	25,000	-	25,000	-

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 067 | 876 | 968

11. SECONDARY PURPOSE CODE

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

A. Code	BL	R/AG	TECH	TNG			
B. Amount							

13. PROJECT PURPOSE (maximum 480 characters)

To strengthen the capability of federal, provincial and local institutions to design, implement, and evaluate policies and programs for increasing the production of fuelwood and timber in Pakistan

14. SCHEDULED EVALUATIONS
Interim MM 08 YY 85 | MM 08 YY 87 | Final MM 08 YY 91

15. SOURCE/ORIGIN OF GOODS AND SERVICES
[X] 000 [ ] 941 [X] Local [ ] Other (Specify) Participant

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

17. APPROVED BY
Signature: Donor M. Lion
Title: Director, USAID/Pakistan
Date Signed: MM 07 DD 14 YY 93

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

AID 1330-4 (8-79)

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FORESTRY PLANNING AND DEVELOPMENT

391-0481

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LIST OF ABBREVIATIONS

ACEP	- Agricultural Commodities and Equipment Program
ADB	- Asian Development Bank
ADP	- Annual Development Plan
AID	- Agency for International Development
APAC	- Asia Project Action Committee
AERE	- Agricultural Education, Research and Extension Project
ASIA/PD	- Asia Bureau, Office of Project Development
ASIA/TR	- Asia Bureau, Office of Technical Resources
B/C	- Benefit/Cost Ratio
B.Sc.	- Bachelor of Science Degree
BTU	- British Thermal Unit
CCF	- Chief Conservator of Forests
CDWP	- Central Development Working Party
CF	- Conservator of Forests
CFEF	- Conservator of Farm and Energy Forestry
COP	- Chief of Party
DFEFO	- Divisional(or District) Farm and Energy Forestry Officer
DFO	- Divisional or District Forest Officer
DIGF	- Deputy Inspector General of Forests
EFE	- Energy, Forestry and Environment
EP&D	- Energy Planning and Development Project
ESF	- Economic Support Fund
FAA	- Foreign Assistance Act
FAC	- Food, Agriculture and Cooperatives
FAO	- Food and Agriculture Organization

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FAR	- Fixed Amount Reimbursement
FD	- Forest Department
FEF	- Farm and Energy Forestry
FNR	- Forestry and Natural Resources
FSN	- Foreign Service National
FY	- Fiscal Year
GDP	- Gross Domestic Product
GOP	- Government of Pakistan
GTAS	- General Technical Assistance Services
IBRD	- International Bank for Reconstruction and Development
IEE	- Initial Environmental Examination
IGF	- Inspector General of Forests
IMF	- International Monetary Fund
IRR	- Internal Rate of Return
JCC	- Joint Career Corps
M/FAC	- Ministry of Food, Agriculture, and Cooperatives
MIRR	- Modified Internal Rate of Return
M.Sc.	- Master of Science Degree
NWFP	- Northwest Frontier Province
O/	- Office of
O/E&E	- Office of Energy and Engineering
OFWM	- On-Farm Water Management Project
PACD	- Project Assistance Completion Date
PARC	- Pakistan Agricultural Research Council
PCCF	- Provincial Chief Conservator of Forests

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PFD	- Provincial Forest Department
PFI	- Pakistan Forest Institute
PID	- Project Identification Document
PMDC	- Pakistan Mineral Development Corporation
PP	- Project Paper
PPC	- Program & Policy Coordination
PSC	- Personal Services Contract
SER/CM	- Services/Contract Management
SER/COM	- Services/Commodity Management
SER/DM	- Services/Data Management
S&T	- Science and Technology
TR/EFE	- Technical Resources/Energy, Forestry, and Environment
UNHCR	- United Nations High Commission for Refugees
USAID	- United States Agency for International Development
USDA	- United States Department of Agriculture
USG	- United States Government
WAPDA	- Water and Power Development Authority
WFP	- World Food Program
WLSFD	- Wildlife and Forest Department

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I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. Funding

USAID/Pakistan recommends that an ESF grant of $25.0 million be authorized for the Forestry Planning and Development Project which has a Project Assistance Completion Date (PACD) of September 30, 1991

2. Geographic Code

The Project authorization should specify that, except as A.I.D. may otherwise agree in writing:

a. goods and services financed by A.I.D. under this Project shall have their source and origin in the United States (A.I.D. Geographic Code 000) or Pakistan;

b. ocean shipping for all commodities financed by A.I.D. under this Project shall be only on flag vessels of the United States or Pakistan; and,

B. Summary Project Description

The primary goal of the Forestry Planning and Development Project is to help Pakistan increase its indigenous energy supplies and achieve energy self-sufficiency. The secondary goal is to reverse the process of deforestation in Pakistan and to expand the extremely limited forest base. The primary purpose of the project is to strengthen the capability of federal, provincial, and local institutions to design, implement, and evaluate policies and programs for increasing the production of fuelwood and timber in Pakistan. The secondary purpose of the project is to demonstrate the economic, technical, and social feasibility of producing tree crops on privately-owned farm and range lands.

These goals and purposes will be achieved by strengthening the capability of the Government of Pakistan to: (1) collect data, conduct systematic analyses, and develop integrated federal and provincial plans for the cost-effective development of forest resources on the public and private lands of the country; (2) design, assess, justify, and evaluate specific forest development projects that meet the

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needs of the population; (3) develop and conduct a program of research leading to the design of improved farm forestry management systems that produce fuelwood and timber while enhancing agricultural productivity; (4) establish and conduct an educational program to train professionals in the techniques of farm forestry; (5) establish units within the Provincial Forest Departments to conduct farm forestry assistance programs; and, (6) institute an operational program to demonstrate the social, economic, and technical viability of farm and energy forestry systems. The project will consist of three closely-related components: (1) institutional and manpower development; (2) farm and energy forestry research; and, (3) farm and energy forestry field operational activities.

The institutional and manpower development component has three primary purposes. First, it is intended to strengthen the capability of the Federal and Provincial Forestry Departments to design policies, plans and programs for systematic farm and energy forestry development. This enhanced capability will clarify the development needs in forestry and their financial and social implications for policy-making bodies in Pakistan. The second purpose is to strengthen the capability of the Pakistan Forest Institute, working with related agricultural institutions, to conduct training and research to support the design of farm and energy forestry programs. The third purpose is to strengthen the institutions and train the staff who will encourage and assist private landowners in adopting farm and energy forestry practices on their farm and range lands.

Under this component, technical assistance, training, and commodities will be provided to the Office of the Inspector General of Forests (O/IGF), the Offices of the Provincial Chief Conservators of Forests (O/PCCFs), and the Pakistan Forest Institute (PFI). At the O/IGF, this support will be used to strengthen a policy and planning team and to establish a capability to coordinate and administer farm and energy forestry programs. At the O/PCCFs, assistance will support the enhancement of forestry planning capabilities and the expansion and strengthening of provincial units to assist farmers in analyzing and adopting farm and energy forestry management. At the PFI, support will be provided to improve the training and research capability in farm and energy forestry techniques.

The research component has two purposes. First, the research will provide the information required to identify, evaluate and improve alternative farm and energy forestry strategies. Second, the research component will address more fundamental issues whose clarification could contribute to farm and

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energy forestry productivity and to forest productivity in general. The research program will be centered at the Pakistan Forest Institute and supplemented by activities conducted by the Provincial Forest Departments and the Agricultural Universities. The topics to be addressed will include the economics of managing trees on farm and range lands; the social and anthropological factors affecting the adoption of farm forestry practices; and the design and yield of farm forestry systems.

The primary purpose of the operational component of the project is to demonstrate the technical, economic, and social feasibility of producing tree crops on privately owned farm and range lands. In addition, this component will: provide on-the-job training in farm forestry techniques for foresters, nursery staffs, and farmers; improve fuelwood supplies in project locales; contribute to farm productivity in some of the poorer agricultural regions of Pakistan; and, increase the availability of mine timbers for coal mine development.

Three geographic areas have been selected for operational activities. These include the barani (rainfed) areas of the Punjab and NWFP, the irrigated farmlands of Nasirabad, Baluchistan, and the forest plantations in Sind. These areas were selected for a variety of reasons including the relative scarcity of fuelwood, the demonstrated interest of the farmers and the Forest Departments in these areas, and the availability of land and water for tree crop management.

Although the approach taken will differ somewhat from area to area, the activities will follow a similar pattern. In project years one and two, detailed technical, economic, and social designs of the strategies likely to work in each region will be prepared. During this period, the staff who will be responsible for managing the activities will be identified and provided training as appropriate; farmer advisory groups will be established to help guide design and implementation of operational activities; designation of the initial planting sites will be made; and, the nurseries necessary to provide seedlings during years three and four of the project will be organized and initiated. In project years three and four, the initial planting of seedlings on the project sites will occur. An evaluation conducted at the end of year four will play a substantial role in shaping the strategy for the final four years of the project. It is anticipated that tree planting will be substantially increased by using the strategies that have proven most successful during the early stage of the project in locales where farmers show the greatest interest. This

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planned expansion may, in fact, be considerably greater than currently anticipated since the World Bank plans to participate in the evaluation activities for A.I.D.'s project and may support a complementary effort based on project results and findings.

The proposed allocation of A.I.D. funds is shown in Table 1.

TABLE 1

PROPOSED ALLOCATION OF A.I.D. FUNDING BY PROJECT COMPONENT

Project Component		A.I.D. Funding[a/] (in $ millions)
1. Institutional and Manpower Development		9.7
2. Farm and Energy Forestry Research		1.7
3. Farm and Energy Forestry Field Operational Activities		7.7
a. Barani	5.4	
b. Nasirabad	0.8	
c. Sind	1.5	
4. Other Costs		3.7
5. Evaluation		0.4
6. Contingency		1.8
Total		25.0

a/ Does not include $5.0 million earmarked under the FY 1983 Agricultural Commodities and Equipment Program for the importation of commodities in support of the Forestry Planning and Development Project.

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C. Summary Findings

This project is ready for implementation and is considered socially, financially, and economically sound, and administratively and technically feasible.

D. Project Checklists and Mission Director's Certifications

1. The project meets all applicable statutory criteria. Appropriate checklists are included in Annex B.

2. Two certifications signed by the USAID/Pakistan Mission Director are included in Annex C: (a) a FAA 611(e) certification which certifies that the GOP has the capability to implement and maintain the project; and, (b) a FAA 612(b) certification to permit the disbursement of dollars in lieu of U.S. owned rupees to finance local costs.

E. APAC Concerns and Design Guidelines

The concerns and issues raised at the APAC review of the Project Identification Document (PID) for this project and the subsequent design responses are as follows:

1. Beneficiaries

The APAC was concerned that the primary beneficiaries of the project would be large landowners and commercial consumers and that the project could adversely affect landless laborers and tenant farmers. In response to this concern, several implementation actions will be adopted:

a. The operational component has been designed to benefit the small farm family. The project will provide seedlings of species like *Acacia arabica* that are accepted by rural people for fuelwood and fodder use and that are highly productive for these purposes. The project will not emphasize species like poplar and eucalyptus that have high commerical value but are not accepted for traditional uses.

b. The operational component of the project will be located primarily in the poorer tehsils of the barani region of the Punjab and NWFP. In this area, farm sizes are generally small (average is 8 to 10 acres, but the typical landowner has a considerably smaller parcel; e.g., in the Kohat district of NWFP, 50 percent of the landowners own two acres or less of arable land); the land is much less productive than in the irrigated regions of the country; and, rural people currently rely on cow dung and crop residues for fuel since wood is particularly scarce.

c. The primary objective of the operational components in the barani and in Nasirabad, Baluchistan will be to provide sufficient seedlings to each farm family to enable it to produce fuelwood to meet all of its domestic energy needs. Families who are distant from wood markets will use all of their tree production for on-farm uses (fuelwood, fodder, and farm timbers) while those closer to markets may wish to sell the commercial component of the trees (about 60 percent of the volume). The project will provide additional seedlings for the latter to ensure that sufficient wood is produced to meet the family's fuel requirements.

d. The project will require each farm family to provide the labor necessary to plant and maintain the seedlings provided by the project. If owners of large landholdings wish to plant large acreages to trees, they will be required to hire the planting labor to do so. During project implementation, consideration will be given to the possibility of charging owners of large landholdings for the seedlings provided in excess of the family's self-sufficiency requirements.

e. The project design team investigated the role of tenants in the proposed project locations. This information is summarized for all proposed tehsils by province in the Project Description Section and is detailed by tehsil in Annex F. Tenants in project locations by tradition have the right to lop landlords' trees for fuel-wood and fodder (in excess of 40 percent of the tree volume produced by the project). Additional information on this subject will be collected in each project location during the first year of project implementation.

f. The project will provide for extensive farmer involvement in project implementation. The following approaches are among those to be pursued:

i. Farmer advisory councils will be established at the tehsil, district, and provincial levels to assist in designing detailed implementation plans and in monitoring project progress. USAID/Pakistan will monitor this activity closely to ensure that lower income farmers are represented on these councils.

ii. The farm and energy forestry outreach programs organized by the Provincial Forest Departments will rely on village opinion leaders as the local "motivators" for the project. These people will be selected not because of the positions that they hold in the local villages but because of their demonstrated ability to influence people through their actions and advice.

iii. Training programs that involve both farm leaders and forest officers will be organized to encourage an exchange of views and to foster an understanding as to the needs of farmers that must be met.

iv. Extensive training will be provided to educate farmers in the advantages of on-farm tree crop management and in the skills required for its implementation.

2. Site Specific Analyses

The APAC requested that the project paper include site-specific analyses for each of the farm and energy forestry field operational areas. These analyses are summarized in the Project Description, the Technical, Economic, and Social Soundness Analyses, Annex F, and technical reports on file with USAID/Pakistan and ASIA/TR/EFE.

3. Expansion of the Bureaucracy

The APAC recommended that the project be designed in a manner to minimize the expansion of the Forest Department bureaucracies. In response to this concern, several implementation approaches have been adopted:

a. Under the project, the O/IGF and the Provincial Forest Departments will identify existing senior professionals who are predisposed toward managing the farm forestry program. A series of short courses will be offered to help them adapt their existing skills to the needs of the farm and energy forestry program.

b. In lieu of establishing an extensive field staff, the farm and energy forestry program will be coordinated at the tehsil level by a professional farm forester. At the village level, he will be assisted in his outreach function by village opinion leaders who will be hired temporarily as consultants to serve as farm and energy forestry motivators.

c. Rather than establishing Forest Department planting crews, the project will require the farm family to plant the trees on its own lands under the technical guidance of the farm forester and the village motivators.

d. The project will provide assistance to help the private sector establish the nurseries required for project implementation. Establishment of some government nurseries may also be necessary in certain situations, but preference will be given to private nurseries.

e. The project will provide assistance for collecting data and conducting analyses that will lead to the creation of an integrated forest plan for both the public and private lands of Pakistan. This planning process will explicitly consider the trade-offs between forestry on government lands and assistance for forestry provided to the private sector. The plan could result in a shift of GOP effort from the public lands to private sector forestry.

4. Relationship with Agriculture

The APAC requested investigation of potential links between forestry and agriculture. In response, the project has been designed such that:

a. all research conducted with the support of the FP&D project will be coordinated by the Pakistan Agricultural Research Council (PARC) through its Forestry Research Technical Committee which is comprised of senior federal and provincial forestry officials, the Director General of PFI, and PARC agriculturalists and by the PFI Research Review Committee;

b. explicit steps will be taken to coordinate and integrate the research and training conducted by the Pakistan Forest Institute with that of the Agricultural University at Peshawar and the National Agricultural Research Center (See Section III.C.2.); and,

c. explicit steps will be taken to coordinate the research conducted by the proposed Punjab Forest Department research station at Gatwal with the agricultural research conducted by the Agricultural University at Faisalabad.

Developing the formal mechanisms necessary to execute "b" and "c" above will be the joint responsibility of the first curriculum advisor to PFI and the Director General of the PFI. The outreach components of the FP&D project will be linked with the agricultural extension agencies on a village by village basis where the agricultural extension agencies have proven to be effective or where they are being improved by the Agricultural Education, Research and Extension (AERE) Project (391-0477). Integration of forestry and agricultural research and extension activities will be strengthened and assured by Mission staff and A.I.D.-financed long-term contractors working side by side on both this FPD project and the AERE project. In addition, the Vice Chancellor of the University of Agriculture at Peshawar, which will be the focus of a major institution-building effort under the AERE project, is a forester whose previous job was Director General of PFI. His interest in

and recognition of the importance of integrating agriculture and forestry should greatly facilitate the establishment of formal mechanisms for this purpose.

5. Project Analyses

a. Social Soundness

The APAC expressed concern regarding the use of incentives to stimulate local participation, farmer perception of market opportunities for selling timber and fuelwood, and the nutritional consequences of removing land from agricultural production. The project has been designed to assist primarily subsistence farmers in achieving self-sufficiency in their fuelwood production. Because of the economic status of these individuals, the PP design team concluded that credit systems were not appropriate. Interviews with farmers at a variety of locations in the barani and Nasirabad indicated high farmer interest in planting multi-purpose trees that produce fodder, fuelwood, and timber. These farmers recognized the important value of substituting fuelwood for cow dung and freeing up the latter for use as fertilizer. They also viewed soil conservation measures as extremely attractive in situations where they would stop the loss of agricultural land through gullying.

In general, because of their perceptions of these benefits, the small farmers expressed a willingness to plant and protect seedlings, themselves, if the seedlings were provided at no cost by the project. However, where more skepticism was encountered, the small farmer usually responded enthusiastically to the suggestion that one fruit tree seedling would be provided for every 100 fuelwood and fodder trees that he planted. Thus, fruit trees will be provided as an incentive to increase the attractiveness of the project. The project will not provide seedlings for use on land that is currently cultivated except where tree planting can increase agricultural productivity by providing protection or increasing soil productivity. In general, the project is expected to increase food production by producing fodder for livestock and by freeing up dung for use as fertilizer. Therefore, no negative nutritional consequences are anticipated as a result of this project.

b. Financial Analysis

The APAC expressed concern about the GOP's ability to finance recurrent costs. The following steps have been taken to address this issue. First, the GOP has allocated Rs 612 million for farm and energy forestry in the

Sixth Five-Year Plan, a substantial portion of which will cover all salary and salary-based costs for Forest Department staff throughout the project. This represents a major commitment on the part of the GOP to the goals of this project. Also the burden for supporting project-related GOP staff will therefore not increase upon project completion. Second, the nurseries to be established with the help of the project will be organized in the private sector. They will therefore not represent a continuing burden on the GOP after project completion. Third, the project has been designed so that the farm family, itself, bears the labor costs of planting and managing the trees. Thus the costs of continuing these activities will be considerably less for the GOP than might otherwise have been anticipated. Finally, the project has been designed in consultation with both the World Bank and the FAO. Both organizations will participate in evaluations and reviews of the A.I.D. project in anticipation of supporting similar activities as the A.I.D. project nears completion. Thus, additional donor support is likely to be available to assist the GOP in this sector.

c. Environmental Analysis

The APAC noted the potential for enhancing the quality of the environment through sound management of tree crops and recommended that an environmental profile be developed. A preliminary environmental profile has been developed and is included as Annex F. Additional information which was prepared is available in reports by project design team consultants that are on file with USAID/Pakistan and ASIA/TR/EFE. Additional information will be developed as part of the research component's ecological research activity (See Section III.C.2.).

d. Economic Analysis

The APAC requested that the PP describe how timber moves from producer to consumer, who controls harvesting, transport, and marketing, and the impact that the project is expected to have on timber markets. In general, wood is purchased on the stump by profit-oriented middle men who either hire or contract crews to cut the wood and transport it to wholesalers in trade centers. Because of the project's primary focus on providing trees to meet on-farm needs for fuel, fodder, and timber, the direct impacts on timber markets will be modest. However, the long-term effects of the project are expected to be substantial and favorable. These effects are discussed in the Economic Analysis Section.

6. Role of Women

The APAC was concerned that the project be designed in a way to benefit women without adding to their burdens. In response, a project implementation strategy will be employed that emphasizes the project's contribution to the welfare of subsistence lifestyles rather than to the production of timber and fuelwood for commercial markets. Based on individual circumstances including fuel requirements, on-farm need for timber, and proximity to wood market outlets, each farm family will plant a sufficient number of seedlings to meet subsistence fuelwood requirements. These planting models are described more completely in the Project Description Section, in Annex F, and in technical reports on file with ASIA/TR/EFE and USAID/Pakistan. It is envisioned that female members of the farm family will assist in planting and maintaining the seedlings on the family farm which will add to their burdens temporarily. However, this temporary increase in work will be far outweighed by the reduction of effort in collecting fuelwood and gathering and drying cow patties. It is estimated that this work will be reduced, on average, from three hours to one-half hour per day. Additionally, opportunities will be provided on an experimental basis for women to work in seedling nurseries that are organized and run entirely by women.

7. Evaluation

The APAC recommended that previous A.I.D. and other donor experience be reflected in the project design and that the project have a strong evaluation component. Previous A.I.D. and other donor experience is described in Section II.F. and has been incorporated in the design of this project. The evaluation plan is described in Section IV.F. Additionally, training in monitoring and evaluation techniques will be an important contribution of the institutional and manpower development component at both the federal and provincial levels. (See Section III.C.1. and IV.D.)

8. Management of the Project

The APAC requested clarification of how the Mission would manage the project and the GCP institutional mechanisms which would be employed to facilitate project management and coordination. This information is provided in Sections IV.B. and V.B.

9. Narcotics

In addition to the irrigated government plantations in the Sind, the operating locales of the project on privately owned lands are as follows:

Province	District
NWFP	Kohat Karak
Punjab	Rawalpindi Attock Jhelum Gujrat
Baluchistan	Nasirabad

According to the Narcotics Affairs Unit of the U.S. Mission in Pakistan, as far as is known, poppies are not grown in these districts.

F. Project Issues

1. Are the Provincial Forest Departments willing and able to organize and conduct programs to assist farmers with on-farm tree crop management strategies?

The Forest Departments, since their establishement, have been responsible for managing the reserved government forests and the irrigated forest plantations. Professional career paths are well-established in this line of management. Moreover, a set of formal and informal incentive systems makes the management of the government lands an attractive professional opportunity. This attractiveness is enhanced by the pleasure that accrues to land managers from the individual sense of ownership intrinsic in managing large tracts of public lands. Organizing and conducting a farm forestry program will require that some of the most capable foresters give up the well-known incentives of the conventional system and undertake the potentially more frustrating task of working with landowners, primarily low income landowners, to encourage farm forestry practices. Will the Forest Departments be willing and able to do this?

In each of the three provinces targeted for farm forestry activities on privately owned lands under this project, senior Forest Department officials expressed strong enthusiasm for the project. Each of these provinces submitted a proposal to the project design team outlining

the requirements of a farm forestry program. Their concerns have been incorporated in the project description. In each province, several of the more capable mid-level professionals stated their enthusiasm for personally participating in the farm forestry endeavor. However, there is general agreement that many forestry professionals will be reluctant to sacrifice the known rewards of the established system for the unknown opportunities and problems of a new program. Discussions with the Provincial Planning and Development Departments, the Ministry of Food, Agriculture and Cooperatives, other government agencies and other forestry donors reinforced this concern. However, in every case, the individuals involved felt that the project could be successful, if carefully designed, and agreed that the potential benefits more than justified the effort.

The project incorporates several design parameters to respond to these concerns. The project will assist the Forest Departments in establishing small new units to manage the farm forestry program. These units will be headed by senior professionals within the Forest Departments who are committed to the farm forestry program. Short-term training will be provided to assist these professionals in assuming their new responsibilities. In addition, long-term training at the graduate level will be provided both in Pakistan and overseas to develop a small corps of junior professionals who will staff the farm forestry programs. At the local level, village opinion leaders will be selected and hired temporarily to serve as the motivators for the project. This will mitigate the need to hire an extensive Forest Department staff. The operational components of the project are designed to develop gradually -- functioning first as demonstrations and then expanding as the skills of the implementors increase. This entire approach is described in more detail in the Project Description Section.

2. <u>Is the GOP willing to consider and adopt revised forest and fuelwood policies?</u>

Historically, support for forestry activities has represented less than 0.6 percent of the GOP's budget. Fuelwood production, despite its major role in Pakistan's energy balance, has received no support from the federal government and has not been considered as an energy resource by the energy sector. Is the GOP willing to assume greater responsibility for forestry and fuelwood production? In making such a determination, is it willing to consider providing funds in addition to the Annual Development Plan budget to assist the Provinces in increasing the

priority of fuelwood production? Is it willing to consider readjusting the current government emphasis on forestry for public lands to an emphasis that takes advantage of private initiative to produce trees on privately-owned lands? Because of wood's important role as an energy resource, is the GOP willing to increase the federal responsibility for farm and energy forestry even though conventional forestry has been a provincial subject?

Conversations with the Ministries of Food, Agriculture and Cooperatives and Planning and Development combined with recent actions of the GOP suggest that Pakistan is willing to respond positively to all of these issues. In February of 1980, the Cabinet issued a policy directive calling for a major program for the establishment of fast-growing trees for the production of fuelwood through the establishment of programs to assist and motivate private landowners. This commitment was recently strengthened when, in the preparation of the Sixth Five-Year Plan, the GOP allocated Rs 612 million (roughly half to be provided by A.I.D. under this project) to support farm and energy forestry during the next five years. Moreover, the GOP has agreed that all of the support provided by A.I.D. will be provided in addition to that included in the Provinces' Annual Development Plans.

3. Will the Office of the Inspector General of Forests and the Provincial Forest Departments willingly adopt systematic forest planning?

No previous effort has been made in Pakistan to examine the opportunities for forestry and fuelwood development in a systematic manner. Rather than examine how the development and management of forest and fuelwood resources could best contribute to Pakistan's overall development objectives, foresters have traditionally been asked to manage specific tracts of government land in a biologically-sound manner. Little emphasis has been placed on existing and potential markets for forest and fuelwood products, on the economic and financial viability of particular land management practices, or on the relative advantages and disadvantages of encouraging the management of public versus private lands. Are the Forest Departments and the O/IGF willing to adopt a more systematic approach? Will the provinces participate in a federally-coordinated forest and fuelwood planning effort?

Three factors will hinder a systematic approach to forest planning. First, senior officials in the Forest Department lack the skills in planning techniques and knowledge of development economics necessary to conduct an integrated

planning effort. Second, the Provinces regard forestry as their jurisdiction. Coordinated federal planning for forestry and fuelwood development could be perceived as undermining that jurisdiction. Third, with a systematic forest and fuelwood development plan in place, the Forest Departments will be more accountable for the successes and failures of their programs.

Nonetheless, the Forest Departments have expressed substantial interest in developing forest and fuelwood development plans. Why? First, as the skills in financial and economic analysis of the Planning and Development Departments have increased, the Forest Departments have faced greater difficulty in securing government approval for their program budgets and project plans. Second, the development of a federal forest and fuelwood plan could increase the prospects of additional federal funding for Forest Department activities and make larger and more challenging programs possible. Third, a plan that clearly demonstrated the importance of the Forest Departments' programs in Pakistan's overall economic development would enhance the prestige of Forest Department officials. Finally, systematic federal and provincial forest plans would be an asset in attracting donor agency assistance for forestry and fuelwood projects. The project will provide training and technical assistance in the skills necessary to conduct planning exercises and will strengthen the Forest Departments and the O/IGF to help these excercises function efficiently.

4. Will the attitudes of the federal and provincial agricultural sectors evolve in favor of farm forestry practices?

Currently, there is concern among some agricultural leaders that the establishment of farm forestry practices could result in the displacement of land used for agricultural production by tree planting activities. In at least one case, a provincial government turned down a major assistance loan because of this perceived threat. The FP&D project is designed to help counter this attitude. First, a research program will be conducted to design and evaluate on-farm tree crop management strategies that contribute to rather than detract from the production of conventional agricultural crops. To the extent possible, an effort will be made to involve agricultural experts in this research activity. This effort will be strengthened through coordination with the Agricultural Education, Research, and Extension Project (391-0477). Second, the operational components are designed for marginal and submarginal lands, not for lands where agricultural crops are currently being produced. Third, the farm foresters for this project will be trained to

examine the role of farm forestry in the context of the overall farm operation -- not from the perspective of one only interested in growing trees. Fourth, the operational components of the project will produce substantial quantities of fodder. This will contribute to the agricultural sector's goals of encouraging farmers to stall-feed fewer, healthier animals rather than the larger number of weaker animals that they currently range feed. Finally, the project will displace dung currently used as fuel by many farm families and make it available for use as fertilizer and soil conditioner.

5. Will the farmers adopt the practices proposed in the operational components of the Project?

This question is obviously the most fundamental issue underlying the success or failure of the project and the long-term development activities it is intended to stimulate. Initial responses to queries of the design team indicated a strong interest on the part of farmers both in the barani and in Nasirabad in adopting on-farm tree crop management practices. Additionally, the project has been designed to ensure that farmers will have an opportunity to contribute to the detailed implementation strategy as the project develops. Sufficient flexibility is incorporated in the project design to allow changes in approach if modifications prove to be desirable. The technical assistance team and the GOP project leaders will have to assume responsibility for reminding the field foresters that the farmer is the ultimate consumer for this project. Only if this approach is taken will the project be successful. Experience elswwhere suggests that this is possible. (See Section II.F.2.)

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II. BACKGROUND

A. USG-GOP Negotiations

1. Overview

The United States and the Government of Pakistan are embarked on a renewed and strengthened effort to increase their economic and development cooperation. This effort was marked by high level U.S.-GOP consultations in 1981 which culminated in the negotiation of a $3.2 billion package of military and economic assistance which the U.S. will seek to provide to Pakistan between FY 1982 and FY 1987.

The economic assistance component was designed not only to maximize its development impact but also to produce as favorable balance of payments effects as possible. The balance of payments objective reflects two critical purposes of the agreed upon economic assistance: (a) to ameliorate the burden created by Pakistan's increased military expenditures; and, (b) to reduce the constraints on development which balance of payments strains generate. In this manner, the economic, development, and security interests of both nations are interrelated and supported.

The U.S. Economic Assistance Negotiating Team, headed by the A.I.D. Administrator, visited Pakistan in August 1981 to discuss the details of the economic portion of the military/economic package with the Government of Pakistan. These negotiations were successfully completed, and agreement was reached on the FY 1982 ESF program and on areas of concentration for the FY 1982 through FY 1987 period.

2. Strategy

The assistance package is one of the strategic elements of the renewed and expanded USG-GOP relationship. It is one of the instruments required to achieve the U.S. and GOP's mutual goals with respect to security and economic development. The assistance package is seen as an indispensable contribution to the shaping and implementation of a new U.S.-Pakistan relationship and to the critical role in the region which the U.S. Government seeks to assist Pakistan to play. The military-security-political position of Pakistan, including the burden of a massive refugee influx, accentuates the development problem to which the proposed U.S. economic assistance package responds.

The economic assistance program is designed to help Pakistan, one of the world's largest and poorest nations, fulfull the basic human needs of its people. At the same time, it is designed to address the country's foreign exchange needs

through quick disbursing activities while laying the foundation for more rapid economic growth. The program is shaped to assure the widest possible distribution of benefits. The program agreed to by the GOP and U.S. negotiating teams will:

a. reactivate a long-term development assistance relationship, which the U.S. views as important because of Pakistan's size, poverty, strategic location, and other multi-faceted U.S. interests;

b. provide balance of payments support to help address short and medium-term foreign exchange shortfalls, thereby reducing development constraints and strengthening the economy;

c. address key economic problems, which will help enable Pakistan to achieve self-sustaining growth and manage its debt burden;

d. complement and support IMF and IBRD assisted programs, and improve their overall impact; and,

e. expand resources availability for local cost financing.

It was in this context that A.I.D. agreed to allocate $200 million to support energy sector activities in Pakistan. At that point, precisely how these funds were to be allocated had not been determined. The Mission subsequently held discussions with GOP officials which resulted in the provisional allocation of $25 million for a Forestry Planning and Development Project.

B. Country Setting

The total area of Pakistan is approximately 307,000 square miles. It is comprised of four provinces: the Punjab with 26 percent of the land and 58 percent of the population; the Northwest Frontier Province (NWFP) with 13 percent of the land area and 16 percent of the population; Sind with 18 percent of the land area and 22 percent of the population; and, Baluchistan with over 43 percent of the land area and 4 percent of the population.

According to the World Bank (IBRD), Pakistan is the world's tenth most populous and twenty-fourth poorest nation, with an estimated population of about 84 million (as of March 1981) and an estimated per capita GNP of $320 (in 1982).1/ During the mid-1970's, Pakistan's economy was characterized by a low growth rate with a weak domestic and external financial position. Efforts to improve agricultural productivity

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1/ At the exchange rate of U.S. $1.00 = Rs 12.83 in June 1983.

lagged, low private sector confidence resulted in a decline in investment, distortions in the relations between costs and prices became greater, and as in the case of other infrastructure, the development of indigenous energy resources lagged.

Since 1977, major policy reforms have been implemented to improve the economic picture, and the resulting progress is reflected in the approximately 6 percent GDP growth rate per year since that time. This improvement is the result of enhanced agricultural production, industrial sector recovery, and major increases in exports, especially cotton, rice, and textiles. This improvement notwithstanding, the economy remains characterized by low agricultural productivity resulting from lack of sufficient, timely, and appropriate use of inputs and from continuing cost-price distortions. The economy of the country is also characterized by an industrial base with obsolete capital equipment; inefficient public sector enterprises; sluggish private sector investment; and, dependence on imported petroleum products. Pakistan continues to suffer from chronic balance of trade deficits. The balance of payments position remains fragile and vulnerable to relatively minor changes in key variables, such as the weather, terms of trade and worker remittances.

The GOP has intensified its efforts to correct the serious structural imbalances which continue to threaten economic growth. In cooperation with the IMF, IBRD, and ADB, the GOP has undertaken a three-year structural reform program to alleviate imbalances in the economy and to promote growth in the context of relative financial stability and an improved balance of payments situation. Significant among the major domestic components of the program are: accelerated utilization of Pakistan's indigenous energy resources; improvement in agricultural production incentives and reduction in agriculture input subsidies; and, reorientation of public sector investment to emphasize quick-yielding projects and improved efficiency of public sector enterprises.

About 72 percent of Pakistan's 84 million population is rural, with 56 percent of the labor force engaged in agriculture. Agriculture is the largest sector of the economy, contributing 32 percent to the GDP (in PFY 1979/80). It contributes about two-thirds of the nation's commodity export earnings and the major share of raw materials for domestic industry. It also serves as a significant market for the products of other sectors.

C. Forest Sector

1. The Role of Wood in Pakistan's Economic Development

Wood plays a major role in Pakistan's economy but could contribute substantially more to the country's economic

development if increased quantities of sustainable tree crops were available. Improved and expanded tree crop management could enhance Pakistan's energy, agricultural, and industrial development and at the same time contribute directly to the quality of life of the rural and urban poor.

a. Supplies One-Half of Energy for Heating and Cooking

According to the FAO, the World Bank, and the Pakistan Forest Institute, wood supplies about one-half of Pakistan's domestic cooking and heating needs at the present time. Because of the rapidly growing population, the increasing cost of kerosene, and the lack of desirable energy substitutes, the Pakistan Forest Institute projects the consumption of fuelwood to grow substantially during the next decade. Unless fuelwood supplies are increased, a greater percentage of family income or time will be spent to purchase or collect basic energy supplies. As a result, this money and labor will not be available for more productive activities contributing to economic development.

b. Provides Farm Income

Trees also contribute to Pakistan's agricultural sector although their current contribution is only a small fraction of what is possible. Pakistan's farm and range lands supply roughly three-fourths of the country's fuelwood and more than one-half of its forest products. The great majority of trees harvested for these purposes was provided by nature and protected by the farmer until needed. Each year, these timber harvests provide farmers substantial income. There is the potential, however, for this income source to be multiplied many-fold.

c. Improves Agricultural Productivity and Rejuvenates Deteriorated Farmland

Greatly expanded, scientific management of tree crops on Pakistan's farm and range lands could contribute to agricultural productivity while increasing farm income from timber and fuelwood sales. Used as shelterbelts and windbreaks, trees reduce both dessication and direct wind damage to fruit and agricultural crops and increase both the quantity and quality of production. Nitrogen fixation by leguminous trees species, if scientifically managed, can increase soil productivity and agricultural production of both crop and range lands and, at the same time, provide much needed fodder resources. Perhaps most importantly, the use of fuelwood to free dung for use as fertilizer and organic matter could greatly increase the productivity of Pakistan's smaller farms.

The appropriate use of trees could also lower water tables on waterlogged, irrigated farmlands in Pakistan. In extreme situations, establishing tree cover for five to ten years could be used to rejuvenate some of Pakistan's waterlogged or saline agricultural lands or lands where productivity has simply deteriorated due to long use. In all of these cases, tree crops could provide Pakistan with much needed fuelwood and timber and enhance farm incomes while increasing agricultural productivity.

d. Sustains and Extends Hydroelectric Resources

Trees could also contribute to sustaining Pakistan's critical hydroelectric resources. Over 67 percent of Pakistan's land area is severely deteriorated rangeland or completely barren. Much of this land area is located in important watersheds (e.g. Tarbela, Mangla, Kalabagh) that would support tree growth if trees were established. Afforestation of these lands would reduce soil erosion and extend water runoff over a longer period of time. Consequently, the rate of siltation of reservoirs behind dams would diminish; the seasonal generation of hydroelectric power would be extended; and the lives of hydroelectric facilities would be increased.

e. Is Essential for Coal Development

Trees also contribute directly to the development of Pakistan's coal resources. Large quantities of wooden timbers are used to support the roofs of underground coal mines in Baluchistan and Sind. According to Stone and Webster Engineering Corporation, a U.S. based consulting firm, dramatically increased and improved supplies of timber will be required to meet Pakistan's plans for expanding the development of its coal resources in Sind and Baluchistan. Otherwise, much costlier steel beams that require 25 times more energy to produce will have to be used.

f. Contributes Importantly to Construction and Wood-Based Industries

Finally, trees and the wood derived from them provide important materials for construction and manufacturing. Currently, Pakistan's per capita consumption of forest products is ranked with the lowest in the world, a result that has occurred primarily because of the limited quantities of wood that are produced. According to the Pakistan Forest Institute, Pakistan imported approximately 65 million U.S. dollars worth of forest products (primarily pulp, paper, and round and sawn timber) in PFY 1978/79, the last year for which data are available. In the same year, Pakistan exported about 10 million U.S. dollars worth of forest products, primarily sporting goods and furniture. Increased domestic supplies of wood for

construction and paper manufacturing would help Pakistan to overcome its balance of payments difficulties while contributing to its economic development. Similarly, wood supplies must be assured if Pakistan is to continue its production of sporting goods and furniture for export.

2. The Dilemma: Limited Forest Land But Heavy Dependence on Fuelwood

Forest land occupies about 4.3 million hectares in Pakistan or roughly 5 percent of the country's total area. However, much of this forest land is poorly stocked, is comprised mainly of scrubby vegetation, or is inaccessible because of its location in high, mountainous regions. Consequently, only 1.2 million hectares or less than 3 percent of the country's total land base is classified as productive, useful forest. 2/ These forest lands belong primarily to the provincial governments or to relatively wealthy landowners. In both cases, these remaining forest lands have escaped exploitation for one or both of two reasons:

a. They have been reserved by government edict that has been strictly enforced for centuries; and/or,

b. They are located high in the mountains and are virtually inaccessible.

According to the World Bank and the Pakistan Forest Institute, these reserved natural forests, today, provide less than one-fifth of the timber used in producing the forest products consumed in Pakistan and only one-fourth of the fuelwood. Trees harvested from widely scattered locations on Pakistan's farm and range lands supply three-fourth of the fuelwood consumed in the country and well over one-half of the timber for manufacturing forest products. The remainder of the forest products consumed in Pakistan are imported.

Despite Pakistan's limited forest area and poor forest productivity, fuelwood plays a major role as an energy resource within the country. The great majority of Pakistan's people depends on traditional fuels including fuelwood, animal wastes, and crop residues for heating and cooking. According to the Pakistan Forest Institute, roughly 90 percent of the rural population and 50 percent of the urban population use these traditional fuels. The FAO, World Bank, and the Pakistan Forest Institute each estimate that in excess of 16 million cubic meters of wood or more than 95 percent of all wood harvested in Pakistan is used as fuelwood. Nonetheless, the World Bank ranks Pakistan's per capita consumption of fuelwood as one of the lowest in the world (See Table 2).

2/ Pakistan Forest Institute, 1982.

TABLE 2

PER CAPITA FUELWOOD CONSUMPTION IN DEVELOPING COUNTRIES

	In Cubic Meters (M^3)
Nepal	0.73
Burma	0.63
Republic of Korea	0.34
Afghanistan	0.33
Sri Lanka	0.31
Bangladesh	0.21
India	0.20
Pakistan	0.20

According to the Pakistan Statistical Yearbook (1979) and a September 1982 survey conducted by A.I.D. at 43 locations throughout Pakistan, fuelwood prices have increased by a factor between 4 and 5 over the last decade and have more than doubled in real terms (See Table 3). Inhabitants in the rural areas consequently are turning to less desirable crop residues and cow dung. Not only does this change adversely affect the quality of rural life, but it also reduces the quantities of material available as fertilizer and organic matter for farmlands and thus contributes to declining agricultural productivity.

The rising price for fuelwood reflects both rising demand for this important energy resource and a real decrease in actual wood supplies. Both population increases and the rapidly rising prices for imported petroleum products, particularly kerosene, contribute to the increasing demand for fuelwood resources. Pakistan's population is growing at a rate of about 3 percent per year; and, despite the fuelwood price increases of the past decade, fuelwood is still considerably cheaper than kerosene in Pakistan. For example, Pakistan's lowest priced kerosene - wholesale kerosene delivered to the port city of Karachi -- cost Rs 53 per million Btu in 1979 compared with Pakistan's average retail price for fuelwood of Rs 46 per million Btu during the same year. Thus, demand for fuelwood resources continues to grow.

TABLE 3

AVERAGE RETAIL PRICES OF FUELWOOD FOR SELECTED PAKISTAN MARKETS

(Current Rupees/40 Kg Unit)

MARKET	1972	1973	1974	1975	1976	1977	1978	1979	1982	% Change 1972-1982
Sind	5.28	6.29	9.39	N.A.	13.75	13.60	15.97	16.16	17.00	222%
Punjab	6.43	7.00	12.37	13.56	14.53	15.72	16.68	16.82	31.00	382%
NWFP	5.55	6.22	10.12	12.86	17.80	20.37	21.69	22.40	33.00	495%
Baluchistan	4.96	5.44	10.08	12.32	12.47	14.88	15.73	15.64	26.00	424%
Average	5.55	6.24	10.49	12.91	14.64	16.14	17.52	17.75	26.75	382%

Source: Pakistan Statistical Year Book (1979) and USAID/Pakistan (1982).

At the same time, however, the fuelwood resource base is shrinking. As mentioned above, the fuelwood harvest in Pakistan now exceeds 16.3 million cubic meters of wood annually while total harvest of wood from Pakistan's forests (fuelwood and other forest products) exceeds 16.6 million cubic meters.3/ If it is optimistically assumed that 10 percent of Pakistan's farmland is occupied by productive trees, then total growth of wood fiber in the country can be estimated at 13.2 million cubic meters per year (See Table 4). If a more realistic assumption is made that only 5 percent of Pakistan's farmland is occupied by trees, the annual growth of wood fiber would be approximately 11.3 million cubic meters per year. Thus, at best, the annual growth of wood fiber in Pakistan equals 80 percent of the amount of wood harvested annually; while, more realistically, growth is probably less than 70 percent of the amount harvested. Consequently, Pakistan's inventory of wood resources is declining rapidly, and, as the World Bank concluded: "the acute shortage of firewood .... is inducing an expanding rate of encroachment in the woodlands and forests (of Pakistan)."

TABLE 4

ESTIMATED ANNUAL WOOD GROWTH IN PAKISTAN

Land Category	Area (000 ha)	Approximate Growth Rate (m^3/ha/yr)	Total Growth (mm M^3/year)
Forest Plantation	198	6.4	1.3
Govt. Forest Lands	4,100	2.0	8.2
Farmland Trees a/	1,830	2.0	3.7
Total	6,126	-	13.2

Source: Adapted from reports published by the Pakistan Forest Institute, World Bank, and the Pakistan Ministry of Food, Agriculture, and Cooperatives.

a/ Assumes 10 percent of Pakistan's farmland is occupied by productive trees, which is the most optimistic estimate.

3. The Opportunity: Improved and Expanded Tree Crop Management on Privately-Owned Farm and Range Lands

Today, privately-owned farm and range lands provide about three-quarters of Pakistan's total fuelwood production

3/ Pakistan Forest Institute

and more than half of its timber, largely from trees that have grown naturally on unused lands. These lands have the potential to supply vastly increased quantities of fuelwood while providing substantial supplemental income for the rural farmer. In fact, because of the limited quantities of productive forest land in Pakistan and the cost of developing government forest plantations, privately-owned farm and range lands hold the best promise (and in some areas, provide the only opportunity) for the expansion of fuelwood and timber supplies.

Farmers in some parts of Pakistan have already recognized and taken advantage of opportunities to raise profitable tree species as supplemental crops. In the NWFP, farmers have begun to produce poplar on hedgerows and in block plantations. A private nursery has been established to supply seedlings for the expansion of this highly profitable activity. Other farmers, with support from the NWFP Forest Department and the World Food Program, have planted trees for timber, fuelwood, and fruit production throughout the valleys of Kagan, Swat, and Dir. In the Punjab and Sind, farmers have planted trees in hedgerows and protected trees that have sprung up at random to provide shade, fuel, and protection for crops.

However, while some farmers have grasped the opportunities that farm tree crop management provides, much needs to be done to secure tree planting and management on a scale that will reverse the decline in Pakistan's fuelwood and timber inventories and provide the benefits for economic development described earlier. The creation of an infrastructure to develop afforestation policies and programs is essential. Farmers will require demonstrations of techniques for co-producing agricultural and tree crops and training in implementation. Research is necessary to identify and improve useful strategies for producing fuelwood crops while enhancing agricultural productivity. Finally, substantial investment will be required to establish tree seedling nurseries and tree planting programs and to acquire the modern technology necessary for their successful implementation.

4. Constraints to Overcoming the Dilemma

Without question, Pakistan has one of the most capable traditional forestry establishments in the developing world. Though their training is outdated and they are limited in number, many of Pakistan's forestry leaders are unusually capable in conventional forest management and research. A.I.D contributed to this capability through the provision of forestry assistance to Pakistan from 1953 to 1968. The legacy of these programs, which provided study and work opportunities in the United States and resident technical advisors in Pakistan is readily apparent in the senior staff of Pakistan's forestry

Available Document

institutions, the majority of whom were participants in A.I.D.-financed training programs. Furthermore, Public Law 480 funds for Cooperative U.S. Department of Agriculture Research have supported forestry research in Pakistan continuously since 1961. It is evident that the forestry institutions of Pakistan contain a group of leaders who could be trained to direct programs to encourage on-farm tree crop management. Indeed, these leaders are eager to re-establish and extend cooperative activities with forestry representatives from the United States.

However, A.I.D. will have to work closely with the GOP to develop an effective assistance program that truly meets the country's needs. Past assistance activities addressed the biological and technical skills for managing natural forests and rangelands. Unfortunately, they neglected many aspects of resource management that are essential to any forestry program but are particularly vital in the design, implementation, and evaluation of outreach activities. To be successful, A.I.D. should assist the GOP and its provinces to overcome substantial institutional deficiencies, research shortcomings, and technological inadequacies. These constraints are described in more detail below.

a. Institutional Deficiencies

In order to improve the management and productivity of forestry and, particularly, to develop successful, self-sustaining on-farm tree crop management activities, Pakistan must address institutional constraints in six key areas. These include:

i. Policy Development and Program and Budget Justification

As in any country, forestry and afforestation activities must compete with numerous other demands for funds and manpower. The Inspector General of Forests and his two assistants have responsibility for developing forest policies and programs and justifying budget requests in the federal planning and budget processes. The Office of the Inspector General of Forests (O/IGF) is inadequately staffed for developing effective afforestation policies and budgets. Not only must the IGF and his two professional assistants execute many other responsibilities, but they also have no specialized training in the design of outreach programs or in preparing effective assessments of the costs, benefits, and financial viability of alternative afforestation strategies. To develop and sustain an effective voice in federal policy debates, the analytical skills of the O/IGF must be strengthened and expanded.

ii. Project Planning and Assessment

Skills must also be enhanced and staff support expanded for forest planning activities in the Provincial Forest Departments. These Departments must develop and justify afforestation programs in the provincial planning and budgetary processes. Of equal importance, these staffs must develop the capability to design and assess the feasibility of site-specific afforestation projects. Lack of skills in systematic analysis and planning constrain Pakistan's ability to develop an effective on-farm tree crop management program.

iii. Implementation and Management of Outreach Programs

With the exception of some experience acquired by the Forest Departments of the NWFP and the Punjab in managing watershed programs and public tree planting campaigns, the Forest Departments of Pakistan do not have substantial experience in implementing and managing programs to encourage farmers to establish trees as supplemental crops on farm and range lands. Before significant programs to establish trees on these lands can be implemented, foresters will have to be trained in the skills of working with farmers and managing trees to enhance agricultural productivity. Lack of sufficient outreach capability is an important constraint to developing programs on Pakistan's privately-owned farm and range lands to meet fuelwood and timber needs and provide other supplemental benefits.

iv. Project Monitoring and Evaluation

One of the major shortcomings of past U.S. forestry assistance to Pakistan has been the failure to train Pakistani foresters to evaluate the technical and economic lessons provided by forest research and management activities. As with most other donor programs in Pakistan, the purposes of the evaluation components of past A.I.D. and U.S.D.A. forestry assistance projects have been to ensure that project targets were reached and that project funds were expended as planned. In part because of this approach by foreign donors, the Forest Departments in Pakistan have not developed sufficient capacity to evaluate the economic and technical lessons provided by their projects. Consequently, these institutions are not well-prepared to use their experiences to formulate comprehensive, effective, and efficient plans for development of fuelwood and timber resources in Pakistan. The U.S. Forest Service and other U.S. agencies have developed considerable experience with program and project evaluation during the last 15 years as a result of increased public scrutiny of their activities. It will be essential for Pakistan to benefit from these experiences if this proposed A.I.D. project is to make a lasting contribution.

v. Inadequate Training Capability

Because of the hiatus in A.I.D. assistance in forestry to Pakistan since 1968, Pakistan has not been able to take advantage of the major advances that the natural resources community of the United States has made in systematic, interdisciplinary planning and techniques for involving demographic and sociological considerations in project design and implementation. At the present time, there is no effective training in these techniques available in Pakistan. Pakistan's foresters must develop these skills, however, if the Forest Departments are to move from being reactive organizations whose primary responsibility is to protect government resources to being active organizations that design and implement effective resource development strategies. For the proposed A.I.D. project to make a sustainable contribution in Pakistan, it will be essential to provide technical assistance and training for the establishment of professional and technical education in these methods and techniques.

vi. Inadequate Support Infrastructure

Pakistan has a well-established support infrastructure for the management and protection of the government forests. For this role, regional and field offices are adequate, warehouses and storage facilities are available, nurseries are established, and employees have access to vehicles,if necessary. The creation of programs to encourage on-farm tree crop management, however, will require expansion of this infrastructure. In most cases, outreach activities will be located in areas removed from traditional forestry activities. To attract the best foresters to these new responsibilities, and to make it possible for them to work efficiently, office space, warehouses, vehicles and related equipment will have to be provided.

b. Research Experience and Capability Deficiencies

Pakistan's research experience and capability will also have to be improved to provide the base of information and data necessary to design effective afforestation strategies. The Pakistan Forest Institute has the primary responsibility for research in the many aspects that affect tree growth and survival. Extensive research has been conducted to select promising varieties and clones of various species for production in Pakistan. However, research experience and expertise are deficient in several ways that must be remedied if afforestation programs are to be effective in the long term. These include:

i. Lack of Research in Co-Producing Agricultural and Tree Crops

Pakistan has only begun the task of investigating opportunities to use tree crop management to enhance agricultural productivity and farm profitability. Research which has been conducted has focused primarily on optimizing tree yields while maintaining agricultural productivity. To provide a sound basis on which to develop future on-farm tree crop management programs, the research program must be expanded to examine the joint production of agricultural and tree crops with alternative management regimes at locations throughout the country. This research must evaluate not only the biological yields of trees and crops grown under alternative strategies but also the returns to the farm family for these activities. Furthermore, the biological and economic potential for using trees to rejuvenate soils where productivity has deteriorated must be thoroughly examined. Sufficient information exists to provide the basis for conducting pilot programs. However, these pilot projects must be designed to yield useful comparative results and must be supplemented by additional research to provide the basis for the extensive afforestation program that is essential to Pakistan's future.

ii. Lack of Applied Social Science Research

While Pakistan has considerable research experience in examining tree growth and limited experience in the co-production of agricultural and tree crops, it has very little experience in the design and evaluation of alternative strategies to encourage farmers to plant and maintain trees. Because it will have to be located largely on privately-owned farm and range lands, the success of Pakistan's afforestation efforts will depend on the development of sociologically-sound strategies to encourage farmers to plant and manage tree crops. The effectiveness of alternative approaches to involving farmers in the design and management of afforestation activities must be examined.

c. Lack of Appropriate Technology

Finally, Pakistan requires an infusion of technology and equipment to support its afforestation program. Assistance is required in the following areas:

i. Genetic Management and Seed Storage Equipment

Pakistan has research experience in selecting superior quality trees as seed sources. However, it lacks the managerial experience and equipment necessary for the collection of seed from superior trees and for seed storage and distribution. These deficiencies must be overcome if successful afforestation programs are to be developed.

ii. Technology for Nursery Establishment

Pakistan has considerable experience in the management of tree nurseries. Nonetheless, the management of these nurseries could be made more effective through the transfer of techniques developed in the United States during the last 15 years. For an expanded afforestation program to succeed, the provision of basic equipment will be essential. Particularly important needs include tractors for nursery cultivation and pumps and/or water tank trucks for watering.

iii. Technology for Seedling Transportation and Planting

The two major technological constraints to achieving greater afforestation efficiency today appear to be lack of effective systems for transporting seedlings to the planting site and the lack of modern tree planting equipment and techniques. At the present time, seedlings are transported by donkeys and are planted by digging large holes with spades. The provision of hand implements used in the United States for planting trees could improve planting efficiency while four-wheel drive vehicles are essential for moving trees to the planting site. Improved equipment is also required for efficient watering of trees during the first months after planting. Carefully designed and coordinated nursery and planting technologies must be transferred to Pakistan to support an effective afforestation activity.

iv. Earthmoving Equipment

The Forest Departments of Pakistan are also constrained by a lack of earthmoving equipment and trailers for transporting it. As afforestation activities expand on farm and range lands in the Punjab and NWFP, this equipment will be essential for the construction of logging trails for reaching less accessible areas. In the Sind, improved and expanded management of the government forest plantations requires equipment for earth levelling.

v. Computer Equipment

In addition to the absence of technical skills, forest planning activities and analyses are hampered by the absence of computer hardware and software. Such equipment could facilitate project design and evaluation.

D. Institutional Setting

1. The Public Sector

The Ministry of Food, Agriculture, and Cooperatives has responsibility for developing policies and coordinating

programs and budgets for the management of Pakistan's forests. Within the Ministry, these activities are directed by the Inspector General of Forests (IGF) who advises the Minister of Agriculture on forestry matters, coordinates the activities of the Provincial Forest Departments and administers the Pakistan Forest Institute. The Inspector General of Forests has two professional assistants.

The Provincial Governments implement the policy decisions made at the federal level and manage the government-controlled forests. Their Planning and Development Departments determine the level of provincial funding available for both recurring and development expenditures in forestry as in other areas. The Planning and Development Departments must approve all projects and expenditures proposed by the Forest Departments before they can be executed.

A Chief Conservator of Forests directs each Provincial Forest Department. These Forest Departments are organized primarily along geographic lines. A Conservator of Forests heads each major geographic area within a province and in turn supervises Divisional Forest Officers with responsibility for subdivisions within the conservancy. Divisional Forest Officers in turn supervise more junior staff who have direct responsibility for management of smaller geographic areas. In most cases, the Forest Officer is responsible for all activities of the Forest Department within his geographic district. Very little specialization of professional responsibilities has been introduced at this time. However, each Chief Conservator of Forests does have staff for developing forest management plans and a development strategy. Some of the Forest Departments have specialized staffs in activities including sericulture (silk production), fish and wildlife management, resin production, and watershed management.

The World Bank estimates the total combined staff of the four Provincial Forest Departments to between 8,000 and 9,000 people. About 2 percent of this staff has 4 years of professional training obtained primarily from the Pakistan Forest Institute; in some cases, this training is supplemented by one or two additional years of training abroad. An additional 3 percent of the staff has completed 2 years of professional training at the Pakistan Forest Institute. Roughly 15 percent of the staff completes one year of training at a technical forestry school before entering the Forest Departments while nearly two-thirds of the Forest Departments members receives only six months of technical training.

Professional education in forestry and related subjects is the responsibility of the Pakistan Forest Institute (PFI). Located in Peshawar, the capital of the Northwest Frontier Province, PFI offers both undergraduate and graduate (Master's level)

training. The PFI is administered by a Director General who reports to the Inspector General of Forests in the Federal Ministry of Food, Agriculture, and Cooperatives. Competition for entrance into PFI is severe. All applicants are required to pass a written examination. A small number of those passing the exam are then nominated for admission by the Provincial Forest Departments on the basis of subsequent interviews and oral examinations. Before graduating from the PFI, students must complete examinations administered by the University of Peshawar, the organization that grants them their formal academic degrees. 4/

In addition, four schools offer technical training to high school graduates who will become Forest Rangers and Forest Guards. These schools, of which 2 are located in NWFP and one each in the Punjab and Azad Kashmir, are administered by the Provincial Forest Departments and offer six and twelve month courses in the technical aspects of forest management.

The PFI also conducts the great majority of all forest-related research undertaken in Pakistan although some of the Provincial Forest Departments play a role in this area as well. All forestry research is coordinated and approved by the Technical Committee for Forests, Range and Watershed of the Pakistan Agricultural Research Council (PARC) located in Islamabad. At present, 60 percent of the forest research in Pakistan is supported by U.S. PL 480 funds.

The Cabinet of the Government of Pakistan recently issued a policy statement directing the Ministry of Agriculture to establish a major program for producing fast-growing trees in areas outside of traditional forests. This directive is incorporated in the Sixth Five-Year Plan where a Rs 612 million allocation for farm and energy forestry has been made. The main purpose of this program is to encourage farmers to produce tree crops on privately-owned farm and range lands.

2. The Private Sector

The private sector plays a variety of important roles in some aspects of forest production and utilization but a limited role in others. As mentioned earlier, privately-owned farm and range lands provide about three-quarters of Pakistan's fuelwood and more than one-half of its timber. Most of this wood, however, comes from trees that have grown naturally. In the limited instances where farmers are planting tree seedlings on their lands, the Provincial Forest Departments provide the seedlings free or at cost of production. Private tree nurseries are extremely rare in Pakistan. The few that do exist provide seedlings only for the highest value trees including several varieties of fruit trees, bamboo, and high yield poplar.

4/ At present, the administration of examinations and awarding of degrees is the sole basis for interaction between the two institutions.

There are no consulting foresters available in Pakistan to advise farmers on tree crop production. Every forester in Pakistan is employed by the federal government, the provincial government, or by donor agencies. It is unclear at this time whether consulting foresters, if available, would find sufficient demand for their services to sustain viable enterprises.

The private sector, however, does play a major role in timber production and use. All wood on private lands is felled by private contractors as is a substantial portion of the wood cut from public lands. The private sector transports all wood moved in Pakistan. Wood cut from private lands is transported directly to private sector manufacturers, wholesalers and retailers who, in turn, process and market fuelwood and lumber. Wood cut from public lands is transported to wood depots where it is sold at auction to private sector wholesalers. These wholesalers distribute wood to private manufacturers such as matchstick factories and to retailers who produce and sell fuelwood and lumber.

It must be emphasized in the discussion of private sector activity that a substantial fraction of the fuelwood and timber produced in Pakistan is not subject to cash transactions. Although it is not currently possible to accurately quantify the cash and non-cash sectors of the fuelwood markets, there are indications, in rural areas at least, that most fuelwood is collected directly by the consumers from their land or from the land of others. 5/ This characteristic has important implications for both the design of the farm forestry program and related economic analyses.

E. Policy Options and Dialogue Opportunities

The FP&D Project is designed explicitly to contribute to the analysis of policy options and the creation of dialogue opportunities. Policy dialogue will be established through the following means:

1. Creation of Policy Advisory Committees

A Federal Advisory Committee for Farm and Energy Forestry will be established, comprised of senior representatives from the Ministries responsible for agriculture, planning, and energy as well as representatives from each of the provinces and observers from U.S.A.I.D. The Committee will provide a vehicle for integrating farm and energy forest policy with other policies of the agriculture and energy sectors and for developing new policies as necessary. Similar

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5/ University of Punjab, Department of Sociology, 1982

committees will be established in each of the provinces to heighten senior provincial officials' awareness of the role of forestry in agricultural and energy development and to lead to improved provincial decisions regarding farm and energy forestry and related policies and budgets.

2. The Creation of Federal and Provincial Forest Plans

A major component of the project will be the development of provincial and federal forest and fuelwood development plans. This will be Pakistan's first effort in the collection and systematic analysis of information regarding the rôle of farm and energy forestry activities in the country's social and economic development. The collaboration with American technical advisors in this effort will provide an ideal opportunity for discussion and debate over the appropriateness of existing forest policies and the potential usefulness of new or alternative approaches.

3. Training in Policy Analysis and Planning

The project will provide both in-country and overseas (U.S.) training opportunities for Pakistani professionals who do or will play critical roles in the design and implementation of Pakistan's forest policies and in their execution. These training programs will provide numerous opportunities for the trainees to develop and test ideas regarding forest policies for Pakistan and to discuss them with their American advisors.

Through the dialogue opportunities described above, it is envisioned that policy options in three major areas will be evaluated:

1. Policies of the Forestry Sector

A variety of issues regarding the forestry sector and the roles of the Forest Departments could benefit from scrutiny. Most prominent among these are: (a) the relative emphasis the government should place on managing the public forests versus encouraging tree production on private lands; (b) the government's timber and fuelwood marketing policies; (c) the type of products that should be produced on government forest lands; and, (d) the division of federal and provincial responsibilities for forestry planning and management.

2. The Role of Fuelwood as an Energy Resource

For the most part, the role of fuelwood as an energy resource has been ignored by the energy sector to date. Certainly, no attention has been given to how the government's energy policies regarding such aspects as gas and kerosene pricing and coal development will affect fuelwood prices and

use. This is particularly important since cow dung, much needed for soil development, is often the only alternative that the rural people have to burning fuelwood if it becomes inaccessible. Similarly, little thought has been given to the relative advantages and disadvantages of encouraging the development of fuelwood resources as opposed to the other energy alternatives that exist. This project as well as the A.I.D.-financed Energy Planning and Development Project should provide an opportunity to consider such issues and to introduce policy options that could be considered.

3. The Role of Farm Forestry in Agricultural Production and Rural Development

As described earlier, farm forestry practices can play major roles in increasing the production of conventional agricultural crops, in rejuvenating degraded farm and range lands, and in increasing and diversifying farm production. However, the agricultural community has given almost no consideration to these possibilities, and a comparison of these opportunities with other development initiatives of the agricultural sector has not been undertaken. The project will lay the groundwork for evaluating the potential roles of farm forestry in the agricultural development policies of Pakistan.

F. Lessons Learned

1. Previous A.I.D. Support of Forestry in Pakistan

During the 1960's, A.I.D. supported a forestry program in Pakistan which provided long-term training at U.S. universities for 39 Pakistani foresters and provided an in-country, long-term expert who assisted the GOP in technical matters and program development. The project sponsored innovative operational components including the successful introduction of fruit trees into the Murree Hills watershed and improved irrigated tree plantation management.

Although there was a hiatus in A.I.D. development assistance to Pakistan in the forestry sector between 1968-1983, the impact of the 1960's assistance in forestry is evident today. Prior to the A.I.D. program, watershed management capability in the GOP and Provincial Forestry Departments was very weak. Under the A.I.D.-supported, long-term training program, five Pakistanis attended the watershed management programs at Colorado and Utah State Universities. Throughout the 1970's, these five individuals designed watershed programs, incorporated watershed training into the PFI program, and trained DFO's and foresters in watershed management. Today, the watershed management program of the Provincial Forestry Departments is recognized as one of the strongest forestry

divisions of the GOP Forestry Departments. Evidence of the strength of the FD watershed management capability is the planned transfer of the Mangla and Tarbela watershed management from WAPDA to the Punjab FD in July 1983, and the highly successful NWFP/World Food Program watershed management project.

While A.I.D. provided critical forestry support two decades ago which trained the FD watershed management capability that is now being tapped, Pakistan has not been able to take advantage of recent advances that the natural resource community in the U.S. and elsewhere has made in translating forestry into the context of economic development. Farm forestry, policy framework development, financial and economic analysis, project design skills, techniques for building demographic and sociological considerations into project design and implementation, and new technical assistance packages for farm forestry must and will be made available to the Pakistan forestry sector through the proposed Forestry Planning and Development Project.

2. Previous A.I.D. and Other Donor Support of Farm Forestry Projects in LDC Countries

The small percentage of total land area supporting productive forests in Pakistan and the fact that fuelwood and timber are supplied predominantly from privately-held lands differentiates this project somewhat from previous A.I.D. and other donor experience. Nevertheless, several factors which appear to have been responsible for the success of other A.I.D. and donor farm forestry projects are relevant to this project and will be important to successful project implementation. These include:

a. Strong government policy commitments to reforestation and allocation of necessary human and financial resources to achieve large-scale rural tree planting through the creation of appropriate rural infrastructures were critical to successful farm forestry projects in India 6/, Korea 7/ and China. The GOP has recently made such a commitment at the Cabinet level and has allocated Rs 612 million for farm forestry in the Sixth Five-Year Plan.

b. Systematic use of sociological surveys carried out at the household and community levels helped determine the population's likely response to tree planting, their attitudes towards selection of species and other critical issues at the outset of the FAO Village Forestry Project in Nepal 8/. Women's involvement in the decision-making process has been

6/ Madhya Pradesh Social Forestry Project Paper, USAID/India, 1981
7/ Korean Village Forestry Case Study, FAO, 1981
8/ Nepal Village Forestry Project Mid-Term Review, FAO, 1982

increased by such surveys. These will be conducted during the initial implementation stage of the FP&D Project in Pakistan.

c. Small-scale farmers and communities respond positively to the commercial incentive of rising prices, particularly fuelwood and poles, and the farmers' perception that farming fast-growing, short rotation trees as a cash crop can be as profitable as farming some of the traditional agriculture cash crops. 9/ The incentive of private ownership of trees seems to have been a decisive factor in the willingness of individual families in the Sahelian zone countries to protect trees from grazing. All of the trees planted in the barani and Nasirabad components of the FP&D Project will be privately owned.

d. Development of an adequate network of tree nurseries is essential throughout the rural areas so that people do not have to travel long distances to secure a supply of trees. 10/ A willingness of rural afforestation agencies to sub-contract nursery operations to private farmers, schools or to non-governmental institutions interested in growing trees in the Gujrat Social Forestry Program reduced the ratio of nurseries to rural villages from 1:83 at the outset of the project in 1979 to one nursery per every 10 villages in 1982. This project will support the establishment of several privately-owned and operated tree nurseries within each of the target tehsils.

e. The demonstration impact of Government sponsored rural afforestation works such as roadside and shelter-belt planting programs in China and India, have had a positive influence on communities and farmers receptivity to rural tree planting. The potential for using mass media for promoting tree planting is becoming more widely recognized as an essential learning tool. The FP&D project will provide technical and financial assistance for the preparation of information programs through various media.

f. Experience from several countries suggests that outreach forestry programs can be most effectively established by technical forest officers working together with local village people as extension agents (West Bengal, India). 11/ The FP&D project will rely heavily on village opinion leaders as motivators for the project.

g. Provision of credit, cash or other incentives can help ensure that small farmers take up tree crop farming. Combining tree planting with planting of inter-cropped grass or fodder

9/ Cerrea, M. Land Tenure Systems, World Bank Working Paper 452
10/Spears, J., 1983, Tropical Reforestation; An Achievable Goal? World Bank Draft.
11/West Bengal Social Forestry Extension Report, World Bank, 1982

shrubs provides a source of fodder for farmers' livestock and is likely to have significant impact on the farmers' willingness to plant trees. 12/ The FP&D project will produce fodder in combination with fuelwood and will provide fruit tree seedlings as an incentive to establish fuelwood and fodder species.

h. The use of proven technical packages for rural afforestation that include multipurpose trees is essential.13/ The FP&D project will emphasize Acacia arabica, an all purpose species much used by the Pakistani people.

i. Flexibility in project design is essential to allow both farmers and forestry departments to shift from one type of planting activity to another in accordance with local response. This flexibility will be an important part of A.I.D.'s strategy in Pakistan.

j. The absence of a contract or agreement between the FD and the farmer has increased the hesitation of the small farmer to participate in farm tree crop programs. The preparation of a legal framework that defines the socio-economic relationship between the farmers and the FD with respect to tree planting, labor input, protection, management, and benefit distribution has proven very successful in the USAID/India Madhya Pradesh Social Forestry Project. The use of such a contract will be evaluated during the early implementation stage of the FP&D project.

3. USDA Support of Forestry in Pakistan

Over the last three decades, PL 480 funds have provided substantial support to the Pakistan Forest Institute, mainly for species and provenance testing projects. Currently 60 percent of the forest research in Pakistan is supported by U.S. PL 480 funds, but only 4 percent is relevant to farm forestry and fuelwood production. Clearly PL 480 funds provide significant support to forest research; however, the criteria for project selection should be revised to reflect the current interest in on-farm tree crop management and production.

G. Relationship of Project to GOP and A.I.D. Priorities and Programs

1. Government of Pakistan Priority

The Government of Pakistan has recently accorded increased priority to the forestry sector in meeting the

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12/ R. Noronha, 1980, Sociological Aspects of Forestry Project Design. World Bank.

13/ Utter Pradesh Social Forestry Project Mid-Term Review, Mission Report, World Bank, 1983.

energy needs of its development strategy. In February 1980, the Cabinet issued a policy directive calling for a major program for the establishment of fast-growing tree species for the production of fuelwood and conventional forest products in areas outside of traditional forests and for the establishment of compact fuelwood plantations. This directive is to be carried out through the establishment of programs and incentives for the motivation of private landowners. In November 1980, the National Energy Policy Committee directed the Ministry of Agriculture to give priority attention to this program. Subsequently, the Provincial Forestry Departments developed detailed development proposals to expand tree planting and maintenance activities on both public and private lands. In June 1983, the GOP released its Sixth Five-Year Plan, which recommends a major increase in fuelwood production on private lands during the plan period and allocates Rs 612 million for this purpose. This allocation is significant when compared with a total forest development expenditure of Rs 300 million during the six-year period between 1974 and 1980.

2. A.I.D.

a. Relationship to A.I.D. Strategy and Policy

Forestry and fuelwood production are also important components of A.I.D.'s development strategy. Section 119 of the Foreign Assistance Act authorizes A.I.D. to furnish assistance for programs to assess, develop, demonstrate, and apply renewable energy technologies including fuelwood. The 1979 amendments to Section 103 (b) explicitly authorize bilateral assistance to counter forest resource depletion and associated soil and water deterioration. This Section authorizes the President to provide assistance for forestry projects giving emphasis to community woodlots, agro-forestry, protection of watershed forests, and more effective forest management. A.I.D. policy is to promote a balance between conventional energy resources and traditional alternatives including fuelwood. In fact, research into fuelwood production has recently been designated one of the Agency's four major research priorities. 14/ The Regional Strategy Paper for the Asia Bureau specifically identifies deforestation as an important constraint to development and recognizes that the South Asia fuelwood problem is generally more severe than in the rest of the region. 15/ It is also significant to note that energy and natural resources conservation is one of the priority sectors identified in the paper.

14/ 82 STATE 248541 (Cable)
15/ Asia Bureau Regional Strategy Paper, May 1983.

This project is wholly consistent with these policies and development strategies. The FP&D project will directly assist the rural farmer families in establishing profitable tree crops on privately-owned lands. At the same time, it will enhance the institutional capabilities of the research and extension agencies in Pakistan to conduct research and train professionals who will support and further develop these programs from the experience gained with A.I.D.-supported operational activities.

The project will support other A.I.D. policy objectives as well. One of A.I.D.'s primary objectives is to enhance the less developed countries' self-sufficiency and security in food production while increasing the contribution of the agriculture sector to economic growth. 16/ This project will develop human resources and institutional capabilities to develop and apply science and technology to increase and sustain agricultural productivity. This contribution will be achieved by:

1. training scientists and assisting them in establishing research to design farm forestry strategies that increase agricultural productivity;

2. providing fuelwood as a substitute for cow dung which will free the latter for use as fertilizer and soil conditioner on small private farms; and,

3. training farmers and assisting them in the demonstration of farm forestry techniques that produce fuelwood, timber and fodder while contributing to increased arable crop and range land productivity.

This approach to training both farmers and scientists is supportive of A.I.D.'s objectives in technical training. 17/ This project will provide farmer training designed and implemented at the individual tehsil level to help increase the productivity and income of the self-employed farmer. By providing training and technical assistance in policy analysis, planning, project design, and research, the project will also contribute to improved performance of the GOP Forest Departments in meeting the forestry development needs of Pakistan.

16/ A.I.D. Policy Paper: Food and Agricultural Development, 1982.
17/ A.I.D. Policy Paper: Basic Education and Technical Training, 1982

The project will also contribute to A.I.D.'s policy objectives for private enterprise development. 18/ As noted above, the project is primarily aimed at increasing the production of fuelwood, timber, and fodder on Pakistan's small-scale farms. This should strengthen a fundamental economic base of the country and reinforce its ability to contribute to Pakistan's overall development. Similarly, the project will assist in the establishment of privately-owned tree seedling nurseries throughout the project area to produce and sell tree seedlings to farmers. This will strengthen the role of private enterprise in rural areas.

The project will lead directly to the establishment of a policy dialogue on the role of farm forestry and fuelwood production in the agriculture and energy sectors among the ministries and departments of the Federal and Provincial governments. The project will stimulate the establishment of a Federal Advisory Committee for Farm and Energy Forestry comprised of representatives of the Ministries of Agriculture, Planning and Development, and Petroleum and Natural Resources as well as representatives from each of the provinces and an observer from USAID. Similar committees will be established in each of the provinces. At both levels, these committees will observe and review project results, provide guidance to the implementing agencies, and develop the lessons of the project into revised GOP and provincial development policies. These activities directly support A.I.D.'s policies regarding approaches to the policy dialogue. 19/

The project is also consistent with A.I.D.'s recurrent costs policies. 20/ In this project, increases in GOP and provincial staffs will be held to the minimum required to carry out the project. The GOP will pay all salary and salary based staffing costs throughout the project. Private nurseries will be established to provide seedlings to farmers and should not represent a burden on the GOP once they are established. Similarly, the farmer will provide his own labor for tree planting and management. These costs, as well, will not burden the GOP.

Finally, the project will contribute to A.I.D.'s goals supporting the role of women in development. 21/ The social surveys conducted early in the project will provide the basis for improved understanding of the role of women in producing, collecting, and using fuelwood, and this understanding will contribute directly to the final decisions regarding project

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18/ A.I.D. Policy Paper: Private Enterprise Development, 1982
19/ A.I.D. Policy Paper: Approaches to the Policy Dialogue, 1982
20/ A.I.D. Policy Paper: Recurrent Costs, 1982
21/ A.I.D. Policy Paper: Women in Development, 1982

implementation strategies. In any case, it is expected that this project will reduce the burden of women in collecting fuelwood. Additionally, the establishment of tree nurseries staffed completely with women will be attempted experimentally in a number of project locations.

This project will also complement the Mission's overall development program. It focuses particularly on developing an institutional framework for addressing a basic need of the rural poor and therefore has a direct relationship to A.I.D.'s strategy for rural development in Pakistan. A.I.D.'s sector strategies for energy and forestry give high priority to supporting the energy and related forestry programs within the context of overall support for planning and human resources development in energy sector activities. The problems of rising oil prices and shortages of fuelwood and other traditional energy sources are becoming more acute, to the point of seriously threatening the development efforts of Pakistan. Fuelwood is, and will remain, a highly important, domestically-available fuel source. This project will increase its availability and help overcome trade deficits incurred for energy imports. This project is consistent with both A.I.D.'s and the Government of Pakistan's priorities of conserving Pakistan's scarce foreign exchange and assisting its rural areas.

Furthermore, increased fuelwood availability will reduce the use of dung and crop residues for energy and make them available for enhancing agricultural soil productivity. The watershed improvement benefits derived from this project will help sustain hydropower production and irrigation supplies. Cash tree crops will improve farm income; fodder trees will provide feed for livestock as well as timber and fuelwood; and trees planted as windbreaks, shelterbelts, and fallow crops will help sustain and improve agricultural productivity and overcome soil waterlogging. Forest-related employment in Pakistan is estimated at over one-half million; but forestry support for sustained energy and agricultural crop and livestock production has even more extensive benefits for national development.

b. Relationship to Other A.I.D. Projects

The Forestry Planning and Development Project is closely related to four other Mission projects. The FP&D Project directly supports and is supported by the Energy Planning and Development Project (EP&D) (391-0478). Under the EP&D Project, a series of rural energy surveys will be conducted to determine residential energy needs and to identify areas where energy supplies are scarce and fuelwood production is needed. Additionally, a technology assessment and market analysis for efficient woodstoves will be conducted

to develop prototypes and test market them in a variety of areas. This activity could result in halving the amount of fuelwood required per unit of cooking and heating produced and would thus support both projects' goals of achieving energy self-sufficiency and the FP&D Project's secondary goal of reducing deforestation.

The FP&D Project will also support the On-Farm Water Management (OFWM) Project (391-0413). The FP&D Project will advance the goal of the OFWM Project which is to increase agricultural production and improve income for the low income farmer. The FP&D Project will provide a means to rejuvenate lands that have become unuseable because of poor on-farm water management techniques. Additionally, it will train farmers to plant trees at a sufficient distance from watercourses to prevent unnecessary water losses and deterioration of irrigation channel banks.

The FP&D Project and the Agricultural Education, Research and Extension Project (AERE) (391-0477) are mutually supportive. The AERE Project will increase the agricultural sector's capability to provide education, research and outreach assistance. Opportunities for collaboration between the two project efforts include developing complementary educational and research programs in farm forestry between institutions such as the PFI and the Agricultural University at Peshawar and the Punjab Forest Department research station at Gatwal and Faisalabad University. Also, the FP&D and the AERE Projects may be able to take advantage of the same village outreach motivators in at least some of the locations where FP&D field activities are conducted.

Finally, the FP&D Project will be supported by commodities provided by the Agricultural Commodities and Equipment Program (391-0468). This Program will provide about U.S. $5.0 million worth of commodities and equipment to support the various components of the FP&D Project.

H. Other Donor Assistance

Table 5 summarizes the forestry development activities supported by other donor agencies in Pakistan. The activities currently on-going or in advanced stages of planning can be summarized in five categories: afforestation of critical watersheds; intensified management of natural forests; intensified management of government forest plantations; encouragement of tree crop management on irrigated farmlands; and timber harvesting for plywood production. These activities and the donors supporting them are described in more detail below.

TABLE 5

SUMMARY OF DONOR-ASSISTED FORESTRY ACTIVITIES IN PAKISTAN

Type of Activity	Donor	Location	Status
1. Watershed Afforestation	World Food Program	NWFP (Hazara, Swat, Dir)	On-going
	World Bank	Azad Kashmir	On-going
	UNHCR	NWFP & Baluchistan	On-going
2. Intensified Management of Natural Forests	Germany	NWFP (Kagan Valley)	On-going
	Switzerland	NWFP (Kalam, Swat)	On-going
	FAO	NWFP	On-going
3. Improved Management of Government Forest Plantations	Asian Development Bank	Punjab	Pre-Project Review
4. Harvesting Wood for Plywood Production	Poland	NWFP (Dir)	On-going

1. Watershed Afforestation Activities

The most extensive forestry assistance for Pakistan currently is provided by the World Food Program (WFP) in direct support of tree planting to stabilize critical watersheds. The WFP provides food rations for nursery workers and tree planting laborers in support of activities conducted by the Forest Department of the NWFP. This project has been on-going in pilot and operational stages for about 10 years and recently has been extended for an additional six years. To date, roughly 100,000 acres, mainly pine and fruit trees, have been planted. Operations have been concentrated primarily in the Hazara District although operations were recently expanded to the Swat and Dir Valleys. A principal drawback to this project, however, is that it provides no technical assistance or training. Recently, the World Bank provided funds for a similar although smaller undertaking in Azad Kashamir. The WFP plans to expand its effort to the Soan River area of the Punjab.

In the last two years, the United Nations High Commission for Refugees (UNHCR) has also provided food rations to assist the Forest Departments of the NWFP and Baluchistan in afforesting local areas that have been severely deforested by refugees. The areas treated are small and are located in the border regions of the NWFP and Baluchistan. As in the case of the World Bank and WFP activities, however, no technical assistance or training is provided.

2. Intensified Management of Natural Forests

Three organizations are providing assistance to Pakistan to improve and intensify the management of the natural forests and to increase the amount of timber produced per tree harvested. The Swiss, as part of an integrated rural development program in Kalam (located in the upper Swat Valley of the NWFP), are providing technical assistance, training, and equipment to mechanize forest harvesting operations in the mature pine forests. Phase II of the Swiss Project, if financed, will provide assistance in replanting these natural forests. The German Government is also providing assistance to help mechanize forest removal operations. Its project is located in the blue pine and deodar forests of the Kaghan Valley, NWFP. This project provides assistance in skyline logging, road construction, sawmilling, and reforestation. The FAO also provides assistance to the Government of the NWFP for analysis of investment options in managing the natural forests. The NWFP has established a "pre-investment" center with the support of FAO to collect and analyze data regarding options for development of the natural forests.

3. Improved Management of Government Forest Plantations

The Asian Development Bank has proposed to assist the Punjab Forest Department in improving the management of the irrigated government forest plantations in the Punjab. This project has been approved by the Punjab Planning and Development Department after demonstrating that the project will provide adequate returns.

4. Plywood Production

The Polish Government has provided funds, technical assistance, and equipment to assist the Government of the NWFP in harvesting large timber and converting it into plywood in Dir. At present, this project has no reforestation activities associated with it.

5. Summary and Assessment

Each of the donor-assisted activities described above contributes to Pakistan's forestry needs. However, all of these activities address the production of forest products which represent only 11 percent of the total use of Pakistan's wood resources. No project specifically addresses the importance of wood in Pakistan's energy sector. No project provides the technical assistance and training necessary to assist Pakistan in developing a comprehensive wood resource policy and in planning an efficient strategy for its implementation. Furthermore, no project provides the training and technical assistance that is essential if Pakistan is to develop outreach programs that successfully encourage farmers to establish tree crops on their marginal farm and range lands.

The A.I.D. project will provide assistance to fill these gaps that must be overcome if Pakistan is to reverse the depletion of its wood resources and take advantage of the development opportunities that increased wood production could provide. Preliminary discussions with the other donors supporting forestry activities in Pakistan suggest that they find the A.I.D. proposal appropriate and compatible with their activities. Discussions with World Bank and FAO officials further indicated that there is considerable potential for the activities of A.I.D., FAO, and WFP to be mutually reinforcing. Both the World Bank and FAO plan to follow the progress of the A.I.D. project closely and may develop future projects based on the results of the A.I.D. activity.

I. Project Rationale

1. General

Pakistan faces a growing shortage of forest resources to meet its demands for fuelwood, timber, fiber and fodder.

Despite an adequate biological potential and the availability of large quantities of sub-marginal agricultural land, Pakistan continues to consume more wood than it produces, and current rates of afforestation and natural regeneration cannot begin to reverse this trend. The response to this problem has emphasized a very strong government role that inherently limits its potential for success on privately-owned lands. Although data on production and consumption are inadequate, the best available information indicates that the majority of the nation's wood is produced from naturally regenerated trees on private lands. It is this resource that is dwindling. A need thus exists for an effective program to encourage the regeneration and expansion of this resource.

2. Fuelwood and Farm Forestry Production

As demonstrated previously, fuelwood is currently the central concern of the forestry sector. It is the single largest forest product in Pakistan by a very substantial margin. Fuelwood supplies more than half of the domestic sector's energy requirements in Pakistan and a larger share in rural areas. Currently available substitutes for fuelwood have a variety of negative implications ranging from substantially higher costs in the case of gas and kerosene to reduced agricultural productivity if increased amounts of animal dung and crop residues are used for energy. Farmers, today, play the major role in supplying fuelwood in Pakistan. However, for the most part, they rely on trees established and nurtured by nature for this production. Unless these farmers actively adopt on-farm tree crop management, fuelwood shortfalls will intensify with the resultant negative effects described earlier for the quality of life in rural areas, the development of Pakistan's agricultural and energy sectors, and the productivity of the country's land and water resources. Efforts to increase on-farm tree crop management are well-justified. Furthermore, strategies that emphasize the role of private farmland forestry are most likely to complement the existing patterns of fuelwood production and use.

3. Farm Forestry Research

Given the need for increased production of fuelwood and timber on private lands, a variety of important questions arises concerning the relationship of forestry to the overall farm enterprise. Widespread concern exists among farmers and agricultural officials over the effects of trees on the growth of nearby agricultural crops. Regardless of its validity, the lack of conclusive evidence and acceptable examples of successful farm forestry models makes this concern a barrier to increased acceptance of trees as an active part of the farm enterprise. Research is needed to

address this problem.

The beneficial roles of farm trees are also an appropriate topic for research. Potentially profitable areas include but are not limited to shelterbelt protection of crops, mitigation of waterlogging and/or soil salinity in irrigated areas, improvement of soils through nitrogen fixation, and soil conservation.

Appropriate tree species for farm forestry are indigenous to Pakistan. However, there is substantial scope for research programs aimed at improving the yield of these species, particularly Acacia arabica, through breeding and selection. The judicious introduction and testing of a limited number of species new to Pakistan is also warranted.

In addition to the biological questions raised by farm forestry, it is now widely recognized that social and cultural patterns have a major influence on the development and management of forest resources. Cropping and land tenure patterns, hierarchies of family and social structure, nonmarket channels of agricultural product distribution, and local patterns of labor utilization are all important factors that will influence the acceptance and success of farm forestry programs. Initial baseline research on these issues coupled with follow-up studies for evaluation purposes will be vital.

4. Forest Policy Planning and Evaluation

As in any country, forestry and afforestation activities must compete with numerous other demands for government allocations of funds and manpower. At the present time, the Inspector General of Forests and his two assistants must assume responsibility for developing forest policies and programs and justifying budget requests in the federal planning and budget processes. The Office of the Inspector General of Forests is inadequately staffed for developing effective afforestation policies and budgets. Not only must the IGF and his two professional assistants execute many other responsibilities, but they also have no specialized training in the design of outreach programs or in preparing effective assessments of the costs, benefits, and financial viability of alternative afforestation strategies.

Skills must also be enhanced and staff support expanded for forest planning activities in the Provincial Forest Departments. These Departments must develop and justify afforestation programs in the provincial planning and budgetary processes. Of equal importance, these staffs must develop the capability to design and assess the feasibility of site-specific, afforestation projects. Lack of skills in financial analysis,

economics, sociology, and outreach program design severely constrain Pakistan's ability to develop an effective on-farm tree crop management program. The FP&D Project will assist in overcoming these deficiencies.

5. GOP Initiative

Finally, the GOP has made a positive commitment to strengthening farm and energy forestry in Pakistan and has requested A.I.D. assistance in developing its program. Largely in anticipation of the FP&D project, the GOP has allocated Rs 612 million in its Sixth Five-Year Plan for farm and energy forestry activities. The technical assistance, training, and commodities provided through the FP&D Project will be invaluable in assisting the GOP to meet its objectives in this area.

6. Summary

In summary, the FP&D project responds to the GOP request for a farm and energy forestry project, contributes to rural development objectives of the GOP and A.I.D., and addresses directly an important component of Pakistan's energy sector. It is also consistent with A.I.D.'s major areas of emphasis, namely, policy dialogue, private sector, technology transfer, institution-building, and training. Most important, the project is designed to strengthen the capability of Pakistan's own institutions to respond to these needs. The project also contributes to Pakistan's balance of payments and relates well to other projects in A.I.D.'s portfolio and other donor projects both in Pakistan and throughout South Asia.

III. PROJECT DESCRIPTION

A. Project Goal and Purpose

This project will contribute to important development goals in two sectors of Pakistan's economy. The primary goal of the project is to help Pakistan increase its energy supplies and achieve energy self-sufficiency. The secondary goal is to reverse the process of deforestation in Pakistan and to expand the extremely limited forest resource base. The primary purpose of the project is to strengthen the capability of institutions at the federal, provincial, and local levels to design, implement, and evaluate policies and programs for increasing the production of fuelwood and timber in Pakistan. The secondary purpose of the project is to demonstrate the economic, technical, and social feasibility of producing tree crops on privately-owned farm and range lands.

B. Project Outputs

The project is expected to produce the following results:

1. the strengthening of a federal forest policy and planning team with professional staff responsibility for integrating farm and energy forestry activities into federal policies, plans and budgetary allocations;

2. the establishment of provincial forestry planning teams with skills necessary for provincial program planning and evaluation;

3. the strengthening of Federal and Provincial Forest Department infrastructures as required to implement tree crop management programs on privately-owned farm and range lands;

4. the demonstration of tree crop management opportunities on approximately 24.000 acres of privately-owned farm and range lands leading directly to the production of approximately 50 million cubic feet of fuelwood and 2.5 million cubic feet of timber;

5. the improved management of about 2,400 acres of existing forest plantations in Sind and the development of about 400 additional acres of forest plantations leading to the production of approximately 2 million cubic feet of fuelwood and 1 million cubic feet of timber;

6. approximately 427 forestry and related professionals trained and functioning effectively as decision-makers, farm and energy forestry managers, researchers, and analysts with responsibility for farm and energy forestry policies and programs;

7. approximately 20,000 farm families trained in on-farm tree crop management techniques;

8. the development of comprehensive federal and provincial farm and energy forestry development plans; and,

9. the development and initial implementation of a comprehensive farm and energy forestry education and research program.

C. Project Components

The project will consist of three closely-related components: (1) institutional and manpower development; (2) farm and energy forestry research; and (3) farm and energy forestry field operational activities. These three components together will provide the means to help Pakistan overcome the institutional inadequacies, the research deficiencies, and the lack of technology that constrain sound development of its potential forest resources (See Section II). Each component, in itself, is an essential activity. The institutional and manpower development component will enhance the GOP's capability to identify, implement, and evaluate the most promising forestry development alternatives. The research program will provide an improved scientific basis for the technical and socio-economic design of farm and energy forestry activities. The operational activities not only will provide practical demonstrations of the feasible farm and energy forestry development opportunities but will also provide an avenue for direct farmer involvement in the design of these activities. Moreover, they will stimulate the enthusiasm of the personnel involved in the institutional and manpower development aspects of the project. Consequently, these components must be developed in a coordinated and systematic manner. Individuals benefiting from the manpower training programs will play key roles in executing the research and operational activities under the project. Similarly, the research and operational components will provide living laboratories for extensive "on-the-job" training for both managerial forest officers and field foresters and will help to firmly establish the skills developed through manpower training. Careful integration of the research and operational components will contribute to a data and information base on which future policies and plans can be formulated while further developing critically-needed skills for project monitoring and evaluation.

1. Institutional and Manpower Development

This component will strengthen the capability of the GOP and the provinces to:

a. develop sound afforestation and fuelwood policies that are adequately coordinated with the activities and approaches of the agriculture and energy sectors;

b. design and implement cost-effective and coherent plans at the federal and provincial levels for the integrated development of farm and energy forestry and to monitor and evaluate ongoing programs in order to adapt subsequent plans to take advantage of successes and to avoid recurrent failures;

c. design and administer effective and efficient programs to encourage the production of trees for fuelwood, fodder, timber and soil conservation on private lands;

d. provide training for forestry officials to develop improved skills in the design, organization, and implementation of programs to encourage farmers to adopt afforestation practices on suitable lands; and,

e. broaden research capability in the natural and social science aspects of farm and energy forestry systems to build the basis for improving these systems and their management in the future.

To achieve these objectives, activities under this component will focus on the three institutions most significant in shaping and managing Pakistan's forestry development programs : (a) the Office of the Inspector General of Forests (O/IGF) within the Ministry of Food, Agriculture, and Cooperatives; (b) the Offices of the Provincial Chief Conservators of Forests (O/PCCFs); and, (c) the Pakistan Forest Institute.

a. Office of the Inspector General of Forests(O/IGF)

Currently, the O/IGF consists of the Inspector General of Forests (IGF), two Deputy Inspectors General of Forests, (DIGF), a senior professional staff member, and administrative support staff. Directly responsible to the Secretary for Agriculture within the Ministry of Food, Agriculture, and Cooperatives, the Inspector General of Forests is the senior spokesperson for forestry-related activities in Pakistan. He develops and recommends forest policies to the Secretary of Agriculture and to the Cabinet; he coordinates forestry activities in the provinces and supports provincial forestry funding within the Central Development Working Party (CDWP); he develops, justifies, and defends the federal budget for forestry; he has oversight responsibility for the functioning of the Pakistan Forest Institute; he coordinates and promotes watershed management and the program to encourage the public to plant trees during the spring and monsoon rains; and, he plays a significant role in coordinating the foreign aid which Pakistan receives in support of forestry activities. The two DIGFs support him in these activities.

This component of the project will help strengthen the O/IGF in two areas. First, assistance will be provided in the preparation of a federal farm and energy forestry development plan. Second,

assistance will be provided to strengthen the O/IGF's skills in motivating, organizing, and coordinating provincial efforts to encourage farmers to adopt on-farm tree crop management techniques. Specifically, this component of the project will strengthen the capabilities of the O/IGF to :

i. develop, justify, and secure official approval of federal policies necessary to support forestry and fuelwood development in Pakistan;

ii. work with the provinces to develop coordinated, cost-effective farm and energy forestry development plans;

iii. develop and justify the budgets necessary to carry out the development plans and work with the federal government, the provinces, and foreign donor agencies to secure funding to implement them;

iv. assist the provinces in implementing, monitoring, and evaluating farm and energy forestry development programs;

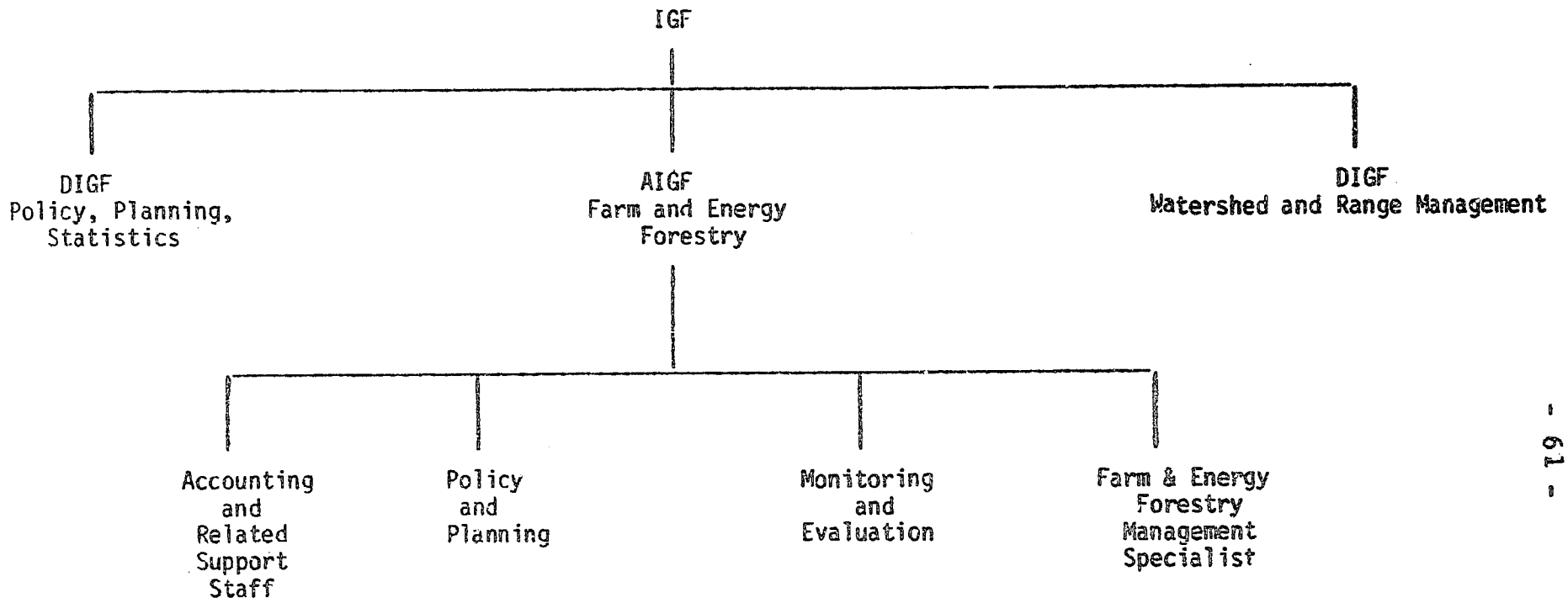
v. assist the Pakistan Forest Institute in developing a coordinated farm and energy forestry training program; and,

vi. coordinate farm and energy forestry development with other relevant programs in the energy and agriculture sectors.

To carry out these functions, the O/IGF will establish an organizational structure similar to that shown in Figure 1. Under this new structure, an Additional Inspector General for Farm and Energy Forestry will be added to the staff of the O/IGF. He will serve as the senior official in Pakistan responsible for farm and energy forestry activities and will be the GOP's Director of the Forestry Planning and Development Project. The AIGF/FEF will have four primary responsibilities. First, he will be responsible for developing a systematic farm and energy forestry development plan. Second, he will coordinate provincial development activities in farm and energy forestry. Third, he will oversee the Pakistan Forest Institute's development of a training and research program in farm and energy forestry to ensure that it will provide the knowledge and skills needed by the provinces to implement, manage, and monitor on-farm tree crop management activities. Fourth, he will assume responsibility for ensuring that the forest sector's farm and energy forestry activities are coordinated with relevant programs in the energy and agricultural sectors.

FIGURE 1

Illustrative Structure for the Office of the Inspector General of Forests



In addition, he will provide technical assistance as needed to assist the other DIGFs in carrying out those aspects of their duties related to farm and energy forestry development.

In the short term, this new structure will not significantly modify the responsibilities of the two existing DIGF positions. One of the existing DIGFs assists the IGF in the long-term duties of the office including policy development, planning, and coordination. The professional occupying this position will help coordinate the farm and energy forestry development planning process supported by this project with plans for the management of the public sector forests. The second existing DIGF assumes responsibility for developing the annual forest sector program, preparing and justifying the budget to support it, and monitoring and evaluating its implementation. As necessary he will assist the new AIGF for Farm and Energy Forestry to develop annual budgets for the Forest Planning and Development Project and to monitor and evaluate its implementation.

The project will provide technical assistance and short-term training to enhance the abilities of the IGF and his staff to carry out the expanded responsibilities that the growing emphasis on farm and energy forestry will require. In addition, the project will provide long-term training for three, highly-qualified individuals who will return to the O/IGF to assist these senior managers in the duties of the O/IGF.

i. Technical Assistance

Over the life of the project, two senior technical advisors will assist the O/IGF to carry out its responsibilities under the project. During the first half of the project, a specialist with experience in farm and energy forestry will assist the O/IGF in the organization of the training and other implementation activities under the project. Along with the AIGF/FEF, he will be available to the provinces to assist them in detailed project design and implementation. This expert will be succeeded in the second half of the project by a senior technical advisor whose expertise lies more in the area of forest development planning. He will provide assistance to the O/IGF in the development of coordinated provincial and federal plans that identify and evaluate the most important opportunities for farm and energy forestry to contribute to Pakistan's overall development objectives. During their respective tenures, each of these advisors will serve as the Chief of Party for all the technical assistance provided by the project.

ii. Training

The project will provide short-term overseas and in-country training in farm and energy forestry, planning,

management, and monitoring and evaluation for the IGF, the AIGF, the DIGFs, and their professional staff members as appropriate. Similar training opportunities could be provided for officials in related activities who also have responsibility for farm and energy forestry issues. In addition, to strengthen further the institutional capabilities of the O/IGF, long-term overseas training will be provided for three qualified professionals who will return to Pakistan to support the AIGF as shown in Figure 1. It is expected that two of these individuals will participate in training programs emphasizing management sciences including policy, planning, project analysis, and administration while the third will focus on the natural and social sciences essential to the design and management of farm and energy forestry programs. The capabilities of the O/IGF will be further strengthened in the long-term as a result of the training and technical assistance provided to the Pakistan Forest Institute (PFI) and the Provincial Forest Departments which are described in the next sections.

b. Offices of the Provincial Chief Conservators of Forests (O/PCCFs)

The administration and management of forestry in Pakistan has always been primarily a provincial responsibility. Because of the growing interest in the importance of fuelwood as an energy resource (a federal responsibility) and the growing recognition of the potential contribution that farm forestry can make to agricultural productivity (a concurrent federal and provincial responsibility), and because forestry research is primarily a federal responsibility, this project will support a substantial strengthening of the capabilities of the O/IGF and PFI. However, the provinces will continue to retain direct responsibility for planning and managing forestry programs on both public and private lands. Consequently, if farm and energy forestry development is to be successful, it will be essential to strengthen the Provincial Forest Departments' skills in planning, managing, and evaluating these programs. The approach taken will be parallel to that developed for the O/IGF described above.

This component of the project will strengthen the capabilities of the O/PCCFs, working with their respective provincial governments, to :

i. develop, justify, and secure official approval of provincial policies necessary to support forestry and fuelwood development;

ii. develop coordinated, cost-effective farm and energy forestry development plans;

iii. develop and justify the programs and budgets to carry out the development plan and work with the provincial and federal governments to secure the funding to implement it;

iv. implement programs that assist farmers in establishing and managing on-farm tree crops using strategies that contribute successfully to the overall farm enterprise;

v. coordinate farm and energy forestry programs at the local level with other rural development activities; and,

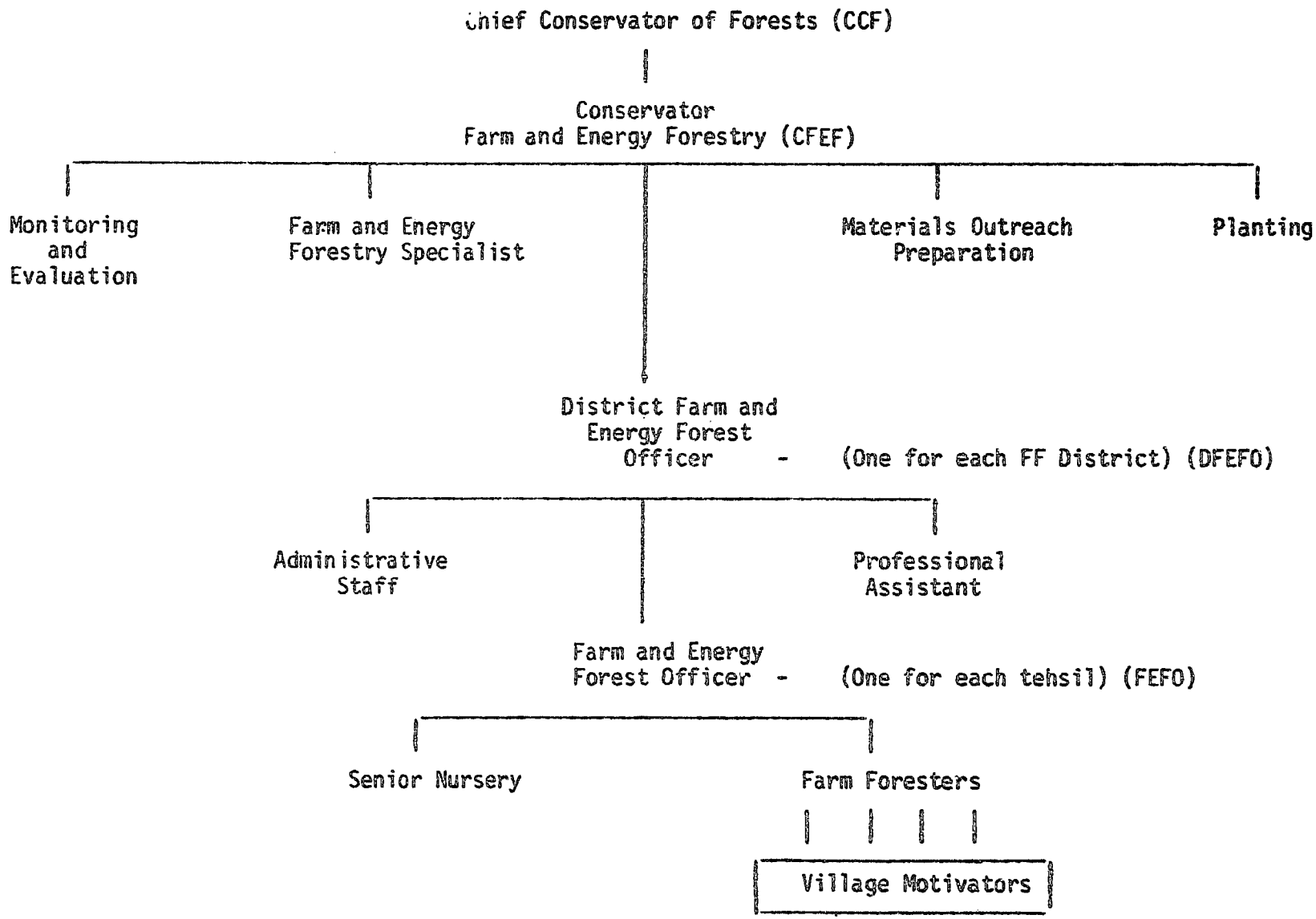
vi. monitor and evaluate farm and energy forestry activities and to modify the plan and program as experience dictates.

To carry out these objectives, the Forestry Planning and Development Project will provide technical assistance and training opportunities for the staffs of the O/PCCFs. The staff structure of the O/PCCFs varies somewhat from province to province. However, within each province, one or more senior forest officers currently have responsibility for planning, project design, budgeting, monitoring and evaluation. Technical assistance and training will be provided by the FP&D Project to enhance the capabilities of these officers and their professional staffs to assist with the responsibilities that growth in farm and energy forestry activities will require. The implementation and management of the farm forestry operational components of the project, however, will require expanding and training a farm forestry staff with the skills and attitudes necessary to assist farmers in planting trees to enhance agricultural productivity. To establish this institutional capability to the extent necessary, the Provincial Forest Departments (PFDs) will establish organizational structures similar to that shown in Figure 2.

As the PCCFs and their Secretaries recognize, the establishment of this staff structure and the designation of personnel to fill each position will have to be accomplished with considerable thought and care. Too often in the past, small farmers have viewed the Forest Departments as being comprised of comfortable bureaucrats whose job was to police rather than assist the local population. Thus, the farm and energy forestry organization will have to be kept lean and must be staffed with individuals who respect farmers and can work with them cooperatively rather than arbitrarily. For the farm and energy forest officers and the farm foresters, experience in local organizational skills and basic farm systems will be more important than skills in tree planting.

Figure 2

A PROPOSED PROVINCIAL FARM AND ENERGY FORESTRY ORGANIZATION FOR PAKISTAN



Consequently, recruitment for these positions will take place both within and outside the traditional forestry community. The FPD Project will provide technical assistance and training to enhance the capabilities of these expanded institutional structures.

i. Training

To strengthen the capabilities of the staff selected to plan, implement, and manage the farm and energy forest component, the FPD Project will provide a variety of training opportunities. It is proposed that each province will designate two individuals to receive long-term overseas training at the M.Sc. level in the design and administration of farm forestry programs. These individuals could have backgrounds in conventional forestry and focus their training experience on the social, economic, and administrative aspects of farm forestry programs. Alternatively, these individuals could have backgrounds in local organization or related fields and focus their training experience more on the technical aspects of farm and energy forest systems. These individuals will return to their respective provinces to work as senior staff in the O/CFEF or the DFEFO in a particularly significant district. Ultimately, these individuals can be expected to assume senior positions in Pakistan for the management of the FEF program.

The development of provincial program plans for forestry has been timed to allow one senior professional member from each province to attend a long-term overseas training program at the M.Sc. level in policy, planning, and administration. Upon their return, it is anticipated that these professionals will serve as senior staff to the CFEFs and will assist them in the planning and evaluation components of the Project.

Four additional long-term training opportunities at the M.Sc. level will be provided in fields that support farm and energy forestry development. These opportunities have intentionally been scheduled to occur later in the project to fill needs that are identified after some experience has been gained. It is tentatively envisioned that two provinces would each designate one person to receive training in the resource economics of farm forestry systems while the two other opportunities might fill training needs in the natural science management aspects of farm and energy forestry on irrigated lands.

A series of short-term training opportunities will be developed to enhance the skills of other O/PCCF staff involved in farm and energy forest management. At least during years

one and three of the project, a month long seminar will be offered that will examine the socio-economic, technical, and administrative aspects of farm and energy forestry programs. These seminars and the operational experiences of the participating staff will be supplemented by an annual Pakistan Farm Forestry Tour that will provide opportunities for further instruction and exchange of ideas among those who manage the farm and energy forestry programs at the provincial, district and tehsil levels. There will also be an opportunity for a limited number of provincial representatives to participate in an Asian Farm Forestry Study Tour. Finally, a series of short-term training courses will be offered for senior members of the O/PCCFs in management, planning, and monitoring and evaluation.

ii. Technical Assistance

To institutionalize the knowledge gained through the training activities, the project will provide technical assistance to help adapt what is learned to the local situation. During the first half of the project, the senior technical advisor to the Inspector General of Forests (whose primary expertise will be in the design and implementation of farm and energy forestry programs) will also play a major role in providing assistance to the provinces. During the first two years of the project, he will be assisted by both expatriate and local technical assistants with skills in anthropology and sociology. These experts will collect and analyze socio-economic information and design the local participation organization that will be essential to develop programs that effectively meet the needs and secure the involvement of local farmers. During years three through six of the project, another expatriate technical advisor will be appointed whose sole responsibility will be to assist the provinces in the implementation and management of their farm and energy forestry development programs.

The expatriate technical advisor for policy, planning, and administration described in the O/IGF section above will be the senior technical advisor to the provinces in support of the farm and energy forestry planning activities. He will work with each of the Provincial Forest Departments during the second half of the project to design and execute a program of data collection and analysis that will lead to the creation of long-term provincial plans for the development of forestry and fuelwood resources in Pakistan. Before the conclusion of the FP&D project, these plans will be coordinated into a federal farm and energy forestry development plan for Pakistan.

c. The Pakistan Forest Institute (PFI)

At present, forestry education in Pakistan covers only the technical subjects needed for on-the-ground management of the country's government forests. No training is available in many of the subjects that contribute to systematic analysis for planning, management, and evaluation. Similarly, no training is available in subjects central to the design and management of farm and energy forestry projects. For example:

i. no courses are taught in the economics of resource management and use or in quantitative methods for systematic analysis used in planning and policy analysis;

ii. curriculum is lacking in the technical aspects of producing trees in combination with various agricultural crops to increase farm productivity; and,

iii. no courses are taught in the social and anthropological aspects of working with and organizing farmers to design and implement programs that meet their needs.

Like teaching, research specifically designed for this area is in its infancy. Current knowledge regarding the design and productivity of ecologically-sound farm forestry systems, the economics of producing agricultural and tree crops in various combinations, the design of sociologically viable methods for organizing programs to meet the needs of farmers, and the technical aspects of species selection and seed improvement does not provide an adequate base to sustain a long-term farm and energy forestry program in Pakistan. To develop further the improved skills and increased knowledge and experience that the project will provide, this component will offer technical support and training to assist the Pakistan Forest Institute (PFI) in developing and implementing professional curricula and research in these subjects and in coordinating related activities at institutions such as the Agricultural University at Faisalabad and the Agricultural University at Peshawar.

i. Technical Assistance

Three technical assistants with university experience in the areas described above will spend overlapping terms of two years each in residence at the PFI. A primary responsibility of the first assistant will be to work with appropriate GOP officials and the Senior Technical Advisor in the O/IGF to select three Pakistani professionals who will

leave immediately for overseas professional training to prepare them to assume responsibility for farm and energy forestry curriculum development and research at the PFI. Subsequently, the technical assistants will work with the faculty of the PFI, the AIGF/FEF, and the PCCFs to:

(1) review the existing curricula at the PFI and other institutions in the Peshawar area, most notably the University of Agriculture at Peshawar, to identify the courses that currently exist that could contribute to a farm and energy forestry curriculum;

(2) develop a farm and energy forestry curriculum development plan that meets the needs of the Provincial Forest Departments for professional skill development in farm and energy forestry and complements the plan to revise and expand the overall M.Sc. curriculum;

(3) design and teach the additional courses required to implement the plan adequately;

(4) work with the faculty of the PFI and the directors of the Provincial Forestry Research Stations (such as Miani in Sind and Gatwal in Punjab) to design and implement a program of research in support of farm and energy forestry; and,

(5) assist the Pakistani professionals who return from long-term training abroad to take over the curriculum and research programs.

All three technical assistants will return at least once after their 2-year assignment to assist in the review and revision of the curriculum and research programs.

ii. Training

In addition to the three Pakistanis mentioned above who will receive overseas M.Sc. training, six individuals will be identified for training in support of the forestry research component. Tentatively, it is planned that two of these individuals will return to the PFI to assume responsibility for research in the ecology of agroforestry systems and in silviculture and tree improvement in support of farm and energy forestry. Additionally, four people will be trained who will assume research duties in the Provincial Forest Departments. Three of these latter individuals will return to work in farm and energy forestry research at the Punjab Forest Department in the research center at Gatwal. They will be charged with developing a collaborative program of research with agriculturalists at the nearby Faisalabad University. Likely areas of training for these individuals include the ecology of agro-forestry systems, socio-economic analysis for the design of farm forestry programs, and the silvicultural and tree improvement aspects of farm and energy forestry. The fourth individual will return to the Sind Forest Department's Miani Station to help

adapt the already strong program of silvics research to the needs of farm and energy forestry development. The research program that will be established through this training and technical assistance is described in more detail in the description of the research component below.

2. Farm and Energy Forestry Research

Under this project component, a comprehensive, long-range farm and energy forestry research program will be developed to provide improved understanding of the advantages and disadvantages of alternative approaches to enhancing agricultural productivity through on-farm tree crop management. This component will be supported by the technical assistance and training described above and will be carefully coordinated with the operational activities described below. It will rely on the operational activities as field experiments to the maximum extent possible. Working with the PFI Research Review Committee and the Technical Committee of the Pakistan Agricultural Research Council that together coordinate forestry-related research, the PFI professionals charged with implementing the research component and the technical assistants will make the final determination of the research priorities that will be pursued under the program. However, it is expected that the research program will include the following essential elements'

a. Economics

Research on the economics of managing trees on farm and rangelands will be centered at the PFI and supplemented with field activities organized in coordination with the project's operational components (described below). Additionally, socio-economic research at the Gatwal Research Center will contribute to an improved understanding of farm forestry systems and will be conducted in concert with the program at PFI. Economic research is required in the following areas:

i. determination of the direct and indirect costs and benefits of producing trees on farm and rangelands in combination with the production of conventional agricultural and forage crops. This research will examine the economic returns to alternative intercropping strategies (both spatial and temporal) and to strategies in which one or more rotations of trees are used to improve degraded agricultural or range soils);

ii. fuelwood marketing systems;

iii. fuelwood supply and demand;

iv. fuelwood utilization patterns; and,

v. existing and desirable levels of forest inventories.

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b. Sociology and Anthropology

Applied sociological and anthropological research will be conducted during the initial implementation stage of the project to contribute to the detailed knowledge of local areas that will be necessary to achieve desired levels of farmer interest and participation. Subsequently, this type of research will contribute substantially to the project monitoring effort and provide insights into adaptations necessary to keep this and future projects on track. Priority studies required in this area include:

i. land tenure patterns and their implications for the design of farm forestry programs;

ii. the social structure of agricultural production, i.e., the contribution of inputs, the allocation of farm outputs, and the role of women, children, and the landless in fuelwood production and use;

iii. baseline demographic, cultural, and socio-economic characterizations of the project area; and,

iv. the identification of methods for organizing local farmers and involving them in project management that seem to have the best probability of achieving satisfactory rates of adoption of on-farm tree crop management by the target population.

As the project proceeds, there should be progressive development of studies on:

i. the acceptance and adoption of on-farm tree crop management by farmers; and,

ii. the impact of the project on land tenure and use patterns and on the roles of women, tenants, and landless laborers.

c. The Design and Yield of Farm Forestry Systems

A third major research need involves the examination of the natural science and technical aspects of systems in which trees are produced in various spatial and temporal combinations with conventional crops on farm and rangelands in the various regions of Pakistan. Specific research needs include:

i. the design and evaluation of alternative tree management approaches intended to enhance the productivity of arable crops while providing supplemental benefits through the production of timber and/or fuelwood;

ii. the design and evaluation of alternative tree management approaches intended to produce fuelwood and fodder on rangelands and submarginal farm lands; and,

iii. the design and evaluation of alternative tree management strategies intended to regenerate degraded soils that are saline, waterlogged, or nutrient impoverished.

In each case, the research will attempt to establish the yields that can be expected for both conventional agricultural crops and tree crops. Of all the research components, this particular one must be integrated with activities of the agricultural sector and its universities. Such integration will be facilitated through the existing institutional framework of the Forestry Research Technical Committee of PARC, which is comprised of both federal and provincial forestry officials as well as PARC agriculturalists. In addition, integration of agricultural and forestry research activities will be strengthened and assured by Mission staff and A.I.D.-financed long-term contractors working side by side on both this FPD project and the A.I.D.-financed Agricultural Education, Research and Extension Project.

d. Species Trials and Seed Supplies

The priority research needs in this area include:

i. the selection and testing of desirable phenotypes (particularly of *Acacia arabica*) for the production of products desired by farmers under the environmental conditions of the project;

ii. the establishment and management of seed stands and seed orchards for the production of seed with the genetic qualities required for farm and energy forestry; and,

iii. the adaptation of seed sources to local conditions and the development of procedures for seed collection, storage, and distribution.

e. Ecological Studies

Research in applied ecology is required to facilitate the adaptation to local conditions of approaches identified as fruitful from the research described above. Particularly needed are:

i. the development of guidelines for the assessment of site factors and characterization of site types that will enable farm foresters to prescribe workable approaches to on-farm tree crop management;

ii. the interpretation for farm forestry of appropriate parts of the reconnaissance soil maps and descriptions produced by the Soil Survey Department; and,

iii. the design and evaluation of workable soil conservation measures for alternative site conditions in the barani region.

f. Hydrological Studies

Finally, hydrological research is needed to improve the management of irrigated farm and energy forest systems, particularly in Sind, Baluchistan, and the Punjab. This research which must be coordinated with the research on the design and yield of farm forestry systems described above, will most likely include the following:

i. the design and evaluation of systems for intercropping trees to enhance agricultural productivity on irrigated farmlands;

ii. the development and testing of efficient watering regimes for use in irrigated farm forestry situations;

iii. the development and testing of efficient watering regimes for use on the irrigated forest plantations of Sind; and,

iv. the development and testing of efficient watering regimes for use with tree crop reclamation of once irrigated farmland abandoned because of high salinity levels and/or waterlogging.

g. Research Support

In addition to the technical assistance and training designed to enhance Pakistan's institutional capability to conduct farm and energy forestry research that has been described earlier, this project will finance vehicles and research equipment for the PFI and Provincial Forestry Research Stations.

3. Farm and Energy Forestry Field Operational Activities

The third major project component will provide assistance for the design and implementation of operational activities to improve and expand farm and energy tree crop management. It will serve as a living laboratory for testing the ideas and practices developed through the institutional and manpower development component. This component will have the following objectives:

a. provision of on-the-job training for farm foresters, tree nursery staffs, and farmers;

b. demonstration of the technical and economic feasibility of improved and expanded tree crop management techniques, particularly for the production of fuelwood in concert with other farm objectives;

c. implementation and evaluation of alternative methods for encouraging farmers to produce tree crops;

d. the establishment of privately-owned seedling nurseries to produce and sell planting stock for farm fuelwood use;

e. the achievement of fuelwood self-sufficiency by approximately 18,000 farm families while increasing fodder production to feed their livestock; and,

f. the substitution of fuelwood for dung as a cooking and heating fuel on farms participating in the project.

Three general areas have been identified for operational activities. These include the barani (rainfed) areas of the Punjab and NWFP, the irrigated farmlands of Nasirabad District, Baluchistan, and the irrigated forest plantations in the Sind.

a. Farm and Range Land Afforestation in the Barani (Rainfed) Areas of the Punjab and NWFP

The barani region extends in an arc from the Jhelum and Gujrat Districts of the Punjab Province to the Kohat and Bannu Districts of NWFP (See Figure 3) and totals between 25 and 30 million acres. The proposed project will focus on a subregion of the barani comprised of about 8.7 million acres and lying in the districts and tehsils shown in Table 6. The project area contains a population of about 5.5 million people, 80 percent of whom live in rural surroundings. Population density in this region ranges between 100 and 500 people per square kilometer and averages about 300 people per square kilometer. In the project area, roughly 10 percent of the land is irrigated for arable crops, just under 50 percent is barani farmland, and the remainder is degraded, gullied, and other wildland used primarily for grazing. Densities of sheep and goats are about average for Pakistan.

Because much of the farmland in this region is of marginal quality, an above average percentage of the male population now works in urban centers and the Middle East. Consequently, the last ten years have witnessed increased abandonment of the marginal and submarginal farmlands in this area. The vast

PAKISTAN OF WOOD POTENTIAL PROJECT AREAS

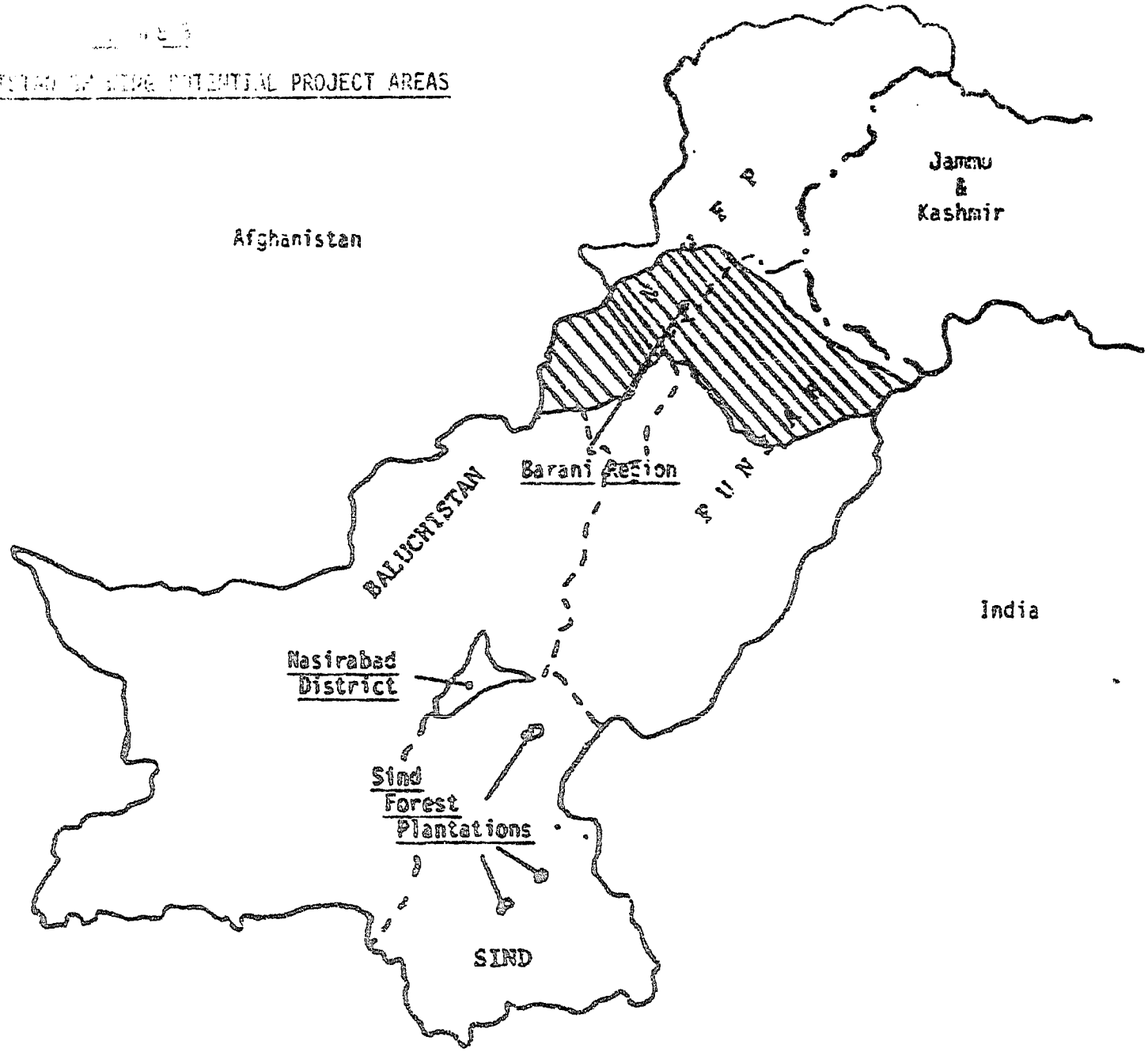

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TABLE 6

LOCATION OF PROJECT SITES IN THE BARANI AREA

Province	District	Tehsils
NWFP	Kohat	Kohat Hongu
	Karak	Karak
Punjab	Rawalpindi	Rawalpindi Gujar Khan Kahuta
	Attock	Attock Pindi-Gheb Fatehjang
	Jhelum	Jhelum Chakwak
	Gujrat	Gujrat Kharian

majority of these farms are worked either by the owner or by the owner in combination with one or more tenants. Only 13 percent of the farms are worked exclusively by tenants (See Table 7).

Average farm size in the area is slightly less than 10 acres although this average holding is skewed upward by a small number of large land holdings.

The barani zone is an especially attractive operational area for the following reasons:

i. people in this region are highly dependent on traditional fuels including cow dung and fuelwood as their residential energy source;

ii. fuelwood in this region is scarce, and many rural people are forced to rely on dung for their cooking and heating needs;

iii. land is privately-owned in small parcels by relatively poor farmers;

iv. rainfall is adequate (15 to 30 inches per year) to allow afforestation without irrigation;

TABLE 7

FARM SIZE AND TENURE IN THE BARANI

Province	No. of Farms	Tenure(%)			Average Farm Size(Acres)			
		Owner	Owner	Tenant	All	Owner	Owner & Tenant	Tenant
NWFP a/	48,342	60	29	11	7.8	6.6	10.9	6.7
Punjab b/	409,026	54	33	13	10.2	9.4	12.2	12.0

SOURCE: 1972 Agricultural Census of Pakistan

a/ Kohat and Karak Districts

b/ Rawalpindi, Attock, Jhelum and Gujrat Districts

v. fodder is scarce, and supplies can be increased through the production of leafy material in combination with fuelwood growth;

vi. large quantities of marginal lands exist which are not suited for agricultural production, but which could grow trees;

vii. the increasing trend for farmers of this region to seek employment in the Middle East has created large areas of unused agricultural crop lands of marginal quality;

viii. siltation of critical watersheds (particularly the Mangla and Kalabagh catchments) is severe and could be somewhat reduced through the use of trees to bind topsoils and through the construction of related irrigation works;

ix. the Government of Pakistan has identified this area as a target for a substantial afforestation effort; and,

x. no other donor agencies have established or plan to establish farm fuelwood activities in the areas proposed for the project.

In addition to the technical assistance and training that will be provided in support of these activities as described earlier under the institutional and manpower development component, this project component will provide commodities and financial support to the Punjab and NWFP Forest Departments to enable them to establish and implement a program to assist farmers in producing tree crops on suitable private lands in the barani region. A.I.D. and GOP funds will be used to:

i. support the establishment and initial operation of an efficient farm forestry staff for the target districts;

ii. assist in the construction of essential office space and warehouse facilities to support these staffs;

iii. assist the private sector in establishing seedling nurseries to provide planting stock for fuelwood and fodder production;

iv. make it possible for farmers to be involved in the organization and supervision of the farm forestry programs;

v. assist in the preparation of educational materials and events that will inform farmers of the benefits of farm forestry and instruct them in its practice; and,

vi. subsidize the cost of seedlings and provide other incentives if necessary to encourage farmers to participate in the program.

At the provincial, district, and tehsil levels, farmer advisory groups will be established to help organize the project so that it effectively meets farmer needs.

The project is intended to encourage farmers and their families to produce trees for on-farm purposes as opposed to trees with primarily commercial value. Seedlings will be provided that contribute to one or more of the following uses: fuelwood, fodder, timber for farm construction activities, and soil enhancement. Because of the critical need for fuelwood to free up cow dung for use as fertilizer and soil conditioner, the objective of the project will be to help each farm family achieve a minimum of self-sufficiency in fuelwood production. Field analyses suggest that the average family requires about 11.3 million kilocalories per year for cooking and heating or about 180 cubic feet (solid) of wood. *Acacia arabica* (babul) is widely accepted by Pakistan's farm families for use as fuelwood and fodder; it grows well in a variety of conditions; and, it is leguminous and adds nitrogen to the soil. *Acacia arabica* can be grown in block plantations on abandoned fields or terraces, in rows along fences or paths, in gullied areas and in a variety of other situations. *Acacia arabica* and

species like it will be the species of choice for use by the project. Four illustrative planting models that are likely to be pursued in project implementation are shown in Table 8.

The afforestation target for this component will be to assist approximately 15,000 farmers in planting the equivalent of roughly 20,000 acres of block plantation with tree species suitable for fuelwood, fodder, soil enhancement, and farm timbers. More importantly, it is anticipated that this component will demonstrate the viability of producing trees as farm and range crops on marginal lands in the barani zone, and thus lead to much more tree planting activity. As described in the technical report (See Annex F), roughly one-third of the area to be planted will require supplemental soil conservation work. It is anticipated that this project component will provide assistance for soil conservation to strengthen the tree planting activities on roughly 8,000 acres.

TABLE 8

ILLUSTRATIVE PLANTING MODELS TO MEET FUELWOOD NEEDS

Zone	Plantation Type	Mean Annual Increment (cu.ft/acre)	Acre Required Per Farmer
Sub-humid	Block or Row	165	1.1
Semiarid	Block or Row	120	1.5
Dry Semiarid	Block or Row	60	3.0
Sub-humid	Block or Row with Grasses Planted Beneath	140	1.5

b. Farm Afforestation on Irrigated Lands in Nasirabad, Baluchistan

With less than three-tenths of one percent of its land area in forest cover, Baluchistan is Pakistan's most impoverished province in terms of forest resources. As a consequence, fuelwood for domestic use, wooden timbers for the construction of coal mines, and lumber for furniture manufacture and construction purposes must be imported from other provinces at substantial cost.

Extremely limited rainfall (3"-8"/year) prevents the establishment of tree crops on unirrigated farm and rangelands in this province. Moreover, the cost of constructing irrigation systems makes the establishment of irrigated forest plantations uneconomic. However, in the Nasirabad District, farmers have expressed great interest in planting trees in combination with irrigated farming to enhance soil quality, to rejuvenate saline and waterlogged soils, to establish shelterbelts to protect rice and mango crops, and to produce fuelwood and timber for both on-farm and commercial use.

The Nasirabad District is located in south central Pakistan near the point where the borders of Sind, Punjab, and Baluchistan meet. Rainfall in this region averages about 5 inches annually. Thus, all crop production is dependent on irrigation canals. At present, the farms of this area produce primarily rice and smaller quantities of wheat, sugar cane, and mango. The population of Nasirabad is about 393,000 people. The project will provide assistance to three of Nasirabad's five tehsils (That Pat, Usta Muhammad, and Dera Murad Jamali). These tehsils have a combined population of about 307,000 people, 91 percent of whom live in rural conditions. Cow dung supplies roughly 40 percent of the population's domestic energy needs and is thus largely unavailable for use as fertilizer and soil conditioner. Approximately 46,000 farms occupy the tehsils of the project area. These farms range in size from a minimum of about 16 acres to a maximum of about 300 acres and have tenure patterns as shown in Table 9.

The Nasirabad District is an excellent target for operational activities for the following reasons:

i. Baluchistan's total and per capita supplies of timber and fuelwood are the lowest in Pakistan;

ii. Nasirabad District has excess irrigation water available to support tree growth as supplemental crops on irrigated farmland. Consequently, this district presents the most economic opportunities for tree production in Baluchistan.

TABLE 9

FARM SIZE AND TENURE IN NASIRABAD DISTRICT

No. of Farms	Tenure (%)			Average Farm Size (Acres)			
	Owner	Owner & Tenant	Tenant	All	Owner	Owner & Tenant	Tenant
21,394	33	15	49	55.6	79.2	79.5	31.1

Source: 1972 Agricultural Census of Pakistan.

iii. farmer interest in on-farm tree crop management in this district is already high, and they have requested assistance from the Provincial Forest Department to establish a tree planting program;

iv. the Forest Department of Baluchistan is designing a pilot project for this area. Lack of technical expertise, manpower, and funding are the major constraints to its implementation; and,

v. the market for wood mining timbers is strong in this district and provides an opportunity to increase farm incomes while at the same time producing fuelwood and fodder from tops and branches.

Support for this project component will be identical to that described above for activities in the barani zone. At both the district and tehsil level, farmer advisory groups will be established to ensure that the organization of the Forest Department staff and the project, itself, will effectively meet farmers' needs. Again, the major objective of this farm forestry activity will be to help meet each family's needs for energy consumed in cooking and heating. Thus, the program is designed to encourage each farm family to establish, at a minimum, the equivalent of one acre of block plantation of A. arabica. Families wishing to market timber as a commercial crop could establish larger quantities of trees.

The principal planting design to be used by the project will be single rows of trees along field margins, irrigation channels, and roads. Block plantations cannot be justified on these lands as a substitute for conventional agricultural crops except to improve moderately saline or excessively light soils. Demonstrations of this potential will be conducted on a very limited scale. The target for this project component is to encourage 3,130 farm families to plant the row equivalent of 3,130 acres of block plantation of fuelwood producing species such as Acacia arabica and to encourage 210 farmers to each plant one acre of block plantation on soils requiring reconditioning for use in high productivity agriculture.

c. Improved and Expanded Management of Irrigated Forest Plantations in Sind

Provincial forests in the Sind, on the average, provide Pakistani markets with 170,000 cubic meters of fuelwood and 110,000 cubic meters of timber each year. Combined, these products represent more than 10 percent of all wood produced in Pakistan. Roughly half of this wood is sold and transported to Baluchistan while the other half is retained for use in the Sind. In both cases, the majority of the timber component is used in the construction of coal mines. These provincial forests are the primary supplier of this product, but production will have to increase substantially to meet Pakistan's plans for expanded coal mining activity in the Sind and Baluchistan over the next decade.

The Province of Sind has designated 180,000 acres of land for the production of fuelwood and timber products on irrigated forest plantations. At present, water supplies are said to be available for about 64,000 acres. However, limited funds and lack of equipment have restricted plantation development to only 24,000 acres. More importantly, serious technical shortcomings substantially reduce both the biological and economic productivity of existing Sind Forest Department plantations. Both technical expertise and financial assistance are required to increase the productivity of existing plantations and to establish productive plantations on additional sites.

Because the Forest Department of the Sind has the authority to reinvest its revenues in additional operational activities, an unusual opportunity exists for one-time assistance from A.I.D. to stimulate long-term increases in host government funding for forestry activities. Furthermore, because the population of Sind is predominantly urban, rural farms are concentrated in large landholdings held by wealthy landowners.

Thus, farm forestry activities in the Sind would not substantially benefit the rural poor. However, fuelwood from provincial plantations is available to the rural poor in the Sind and, furthermore, is shipped to urban areas in both the Sind and Baluchistan where it benefits the urban poor.

Irrigated forest plantations in Sind constitute a sound operational activity under this project for the following reasons:

i. these forests play a major role in supplying fuelwood for Sind and Baluchistan, and their productivity must be increased to continue to meet the fuelwood needs of a growing population;

ii. increased supplies of improved quality timber for mine construction in Sind and Baluchistan are essential if Pakistan is to take advantage of its coal resources for the production of energy as currently planned;

iii. modest levels of training, technical assistance, and funding could substantially improve the management and productivity of existing forest plantations;

iv. the self-financing system for Forest Department operations in the Sind presents a unique opportunity to increase funds available for forestry in the long term; and,

v. the Forest Department of the Sind is expected to benefit substantially from the training program and technical assistance components of the project that were described earlier. Improving and expanding the management of the provincial forest plantations present the most attractive opportunity for further operational development of the skills acquired under the project.

In addition to the training and technical assistance described earlier that will benefit the Sind Forest Department, this project component will provide financial assistance and commodities in support of operational and development activities of the Sind Forest Department. This support will be provided for three activities on Sind Forest Department lands that lie within or adjacent to existing irrigated plantations and outside of the flood control bunds of the Indus River. These activities include:

i. the upgrading and improved management of approximately 1,800 acres of forest on the existing irrigated lands of the Sind Forest Department. Operations will include minor improvements to the irrigation systems, weeding, pruning, thinning when appropriate, clear-felling and replanting. It is estimated that the productivity of the stands thus treated

would increase from about one-third of that attainable with good management practice to about three-quarters of that attainable when good management practice is applied for the whole station. It is recommended that the revenues recovered from these operations be used to establish well-managed stands on these lands when clear-felling is completed;

ii. the conversion of 550 acres of overmature, degraded plantations to productive forests. Operations will include removal of the existing vegetation on the site, major renovations of the irrigation systems including land levelling as necessary, rinsing of the soils if necessary, and planting and managing the stands; and,

iii. establishment of 400 acres of additional forest plantation on lands adjacent to sites where operations (i) and (ii) above are carried out. This program will involve operations similar to those described in (ii) above except that they will require extension of the irrigation systems, rather than renovations, which will be financed under the project.

d. Summary of Operational Components

Tables 10 and 11 summarize the approximate number of farmers expected to participate in the project and the estimated number of acres likely to be planted each year. Combined, the operational components will involve an estimated 18,240 farmers planting the equivalent of an estimated 23,715 acres of trees on marginal farm and rangelands. In addition, 2,768 acres of provincial forest plantation will be improved in the Sind. A more detailed description of the operational components is contained in Annex F.

TABLE 10

APPROXIMATE NUMBER OF FARMERS JOINING PROJECT BY LOCATION AND PROJECT YEAR

Location	Project Year								
	1	2	3	4	5	6	7	8	Total
Barani	-	-	280	840	1680	2520	4620	4960	14900
Nasirabad	-	-	60	180	360	540	1050	1150	3340
Total	-	-	340	1020	2040	3060	5670	6110	18240

TABLE 11

APPROXIMATE ACREAGE TO BE PLANTED

Location	Project Year								
	1	2	3	4	5	6	7	8	Total
Barani	-	-	292	990	2138	3436	6074	7445	20,375
Nasirabad	-	-	60	180	360	540	1050	1150	3,340
Sind (Planting)	-	-	50	150	150	200	200	200	950
Sind (Improvement)	-	596	340	245	247	225	165	-	1,818
TOTAL	-	596	742	1565	2895	4401	7489	8795	26,483

IV. IMPLEMENTATION PLAN

A. Implementation Schedule

All project activities are scheduled to take place over an eight year period beginning in October 1983 and ending in September 1991. Implementation of project components will be phased to ensure a high degree of complementarity among the institution-building, research, and operational activities. The scale and pace of operational and research activities requiring professional staff will be matched to their availability as the training programs initiated early in the program take effect. Continuity will be provided by long-term technical advisors, from the same U.S. firm, at both the federal and provincial levels whose terms will overlap and whose activities will be coordinated by the Senior Technical Advisor to the O/IGF. The illustrative implementation schedule presented in Figure 4 outlines the primary activities to be undertaken within each project component.

To facilitate rapid implementation of the project, the Mission will commence certain activities prior to signing of the Project Agreement. These activities will include the drafting of the PIO/T and RFP for the technical assistance contractor. In addition, the procurement process for some of the commodities to be financed for this project under the Agricultural Commodities and Equipment Program will be initiated. The Mission will also pursue with AID/Washington the recruitment of Joint Career Corps (JCC) personnel to strengthen the Mission's management capability. The Mission has already initiated discussions with the GOP regarding the institutional mechanisms required for effective project management. The GOP has made an initial allocation in its PFY 1983/84 budget for the first year's activities with provision to increase the amount should that become necessary.

As soon as possible after the Project Agreement has been signed and the necessary conditions precedent have been met, the Mission, with the concurrence of the GOP, will: (1) negotiate and award a direct A.I.D. contract to a U.S. firm selected in accordance with A.I.D. competitive procedures for General Technical Assistance Services (GTAS) required in all of the project components; and, (2) procure household and office furniture for the initial long-term technical assistants.

After the arrival of the Senior Technical Advisor/COP and the first group of technical assistants, six major activities will be conducted as follows:

FIGURE 4

ILLUSTRATIVE IMPLEMENTATION SCHEDULE

Activity	USG Fiscal Year								
	83	84	85	86	87	88	89	90	91
I. Preproject Activities and General Project Activities									
RFP drafted for general TA contract		△							
Initiate with AID/W the recruitment of JCC personnel	△								
Project authorized by AID/W	△								
Project Agreement signed	△								
Condition Precedent #1 Met		△							
Condition Precedent #2 Met		△							
Procurement documentation issued for consultant household and office supplies		△							
General TA contractor selected		△							

FIGURE 4

ILLUSTRATIVE IMPLEMENTATION SCHEDULE (Continued)

Activity	USG Fiscal Year								
	83	84	85	86	87	88	89	90	91
II. Institutional and Manpower Development									
A. O/IGF and Provinces									
Technical Advisor (COP) at the O/IGF									
Policy/Planning Advisor (COP) at the O/IGF									
Management and Planning training program developed									
Training									
Long-Term Overseas									
Short-Term Overseas and Incountry									
National and Provincial forestry plans developed									

FIGURE 4

ILLUSTRATIVE IMPLEMENTATION SCHEDULE (Continued)

Activity	USG Fiscal Year								
	83	84	85	86	87	88	89	90	91
B. PFI									
Education technical assistance									
Academic training plan developed									
Training:									
Forestry outreach									
Farm forestry systems									
Resource planning and economics									
BSc/MSc farm forestry program at PFI									
Study tour overseas									
PFI hostel constructed									

FIGURE 4

ILLUSTRATIVE IMPLEMENTATION SCHEDULE (Continued)

Activity	USG Fiscal Year								
	83	84	85	86	87	88	89	90	91
III. Farm and Energy Forestry Research									
Research technical assistance (provided by T/A at the PFI)									
Research training plan developed									
Training in farm and energy forestry research									
Research agenda developed									
Research underway at PFI, Miani and Gatwal									
IV. Operational Activities									
Farm and energy forestry [a] technical assistance									
Farm and energy forestry training program developed									

a/ Provided up to FY 86 by the COP; subsequently, by the long-term FEF consultant.

FIGURE 4

ILLUSTRATIVE IMPLEMENTATION SCHEDULE (Continued)

Activity	USG Fiscal Year								
	83	84	85	86	87	88	89	90	91
A. Farm Forestry in the Barani and Nasirabad									
Rural sociologist/anthropologist		—							
Sociocultural baseline and followup studies conducted		—	—	—	—		—		—
Training:									
Short-term farm forestry orientation and study tours		—	—	—	—	—	—	—	—
Long-term farm forestry systems, outreach, and resource economics			—	—	—	—	—		
Field facilities and nurseries constructed		—	—						
Initial contact with farmers			—	—					
Farmer training			—	—	—	—	—	—	—
Tree planting				—	—	—	—	—	—
Expansion of Farm Forestry field program					—	—	—	—	—

FIGURE 4

ILLUSTRATIVE IMPLEMENTATION SCHEDULE (Continued)

Activity	USG Fiscal Year								
	83	84	85	86	87	88	89	90	91
B. Sind Plantation									
Silvicultural assessment developed		—							
Plantation improvement activities			—	—	—	—	—	—	—
Conversion of over mature stands				—	—	—	—	—	—
Expansion of plantations					—	—	—	—	—
Irrigation and hydrology training			—	—					
V. Evaluation									
Evaluation teams			—		—		—		—

1. the development of a preliminary training plan including identification of suitable candidates and enrollment of the initial group in suitable programs (the prime contractor under the A.I.D.-financed Development Support Training Project will provide participant placement and support services);

2. the initiation of a socio-cultural assessment of the target areas in the operational component to make contact with local organizations, identify local opinion leaders and to establish a baseline for future evaluations;

3. the design and delivery of the initial farm forestry orientation short courses for Federal and Provincial Forestry officials and field staff;

4. the creation of Federal and Provincial coordinating mechanisms and implementing organizations for farm and energy forestry;

5. the evaluation of forest management and silvicultural requirements in the Sind Forest Plantations; and,

6. the preparation by the Mission and the GTAS firm of the necessary documentation for procurement of project commodities.

In addition to these activities, a series of training sub-components including short courses and study tours will be started that will continue throughout the project.

As the project moves into its initial field operations in the second and third project years, new activities will be added while the training programs, particularly the orientation courses for field staff, are continued. Farm forestry field staff will be developing the required facilities in their target areas, including the construction of nurseries in the private sector. Field staff will also be making contact with local farmers and residents. Training programs for farmers will be started at this point. In parallel with these activities, farm and energy forestry research projects will be designed and initiated. The technical consultants at the PFI will assist the faculty and research staff at the Institute to oversee this research and, in the process, will identify candidates for overseas training in research-related areas. These candidates will work on the early stages of the research, undertake their training with related thesis topics, and return to take over the research program. By the end of the third project year, it is expected that the PFI faculty and the technical assistance consultants will be teaching the new farm

forestry curriculum for B.Sc. and M.Sc. candidates. The first external evaluation will take place at the end of the second project year (1985) to assess the results of the early activities and to suggest any necessary fine tuning as the project moves into larger field operations.

The major new activity in the fourth and subsequent years of the project will be the development of federal and provincial plans for public and private forest resources. The O/IGF and provincial planning units will undertake this task with long-term technical assistance provided by the GTAS contractor. The overseas trainees from both long and short-term courses will have returned to provide additional staff for this effort. Two additional short in-country planning courses will be held at this time. Also in this period, the scale of field operations is expected to increase substantially as adoption of farm forestry practices picks up. The first graduates of the new farm and energy program at the PFI will be available to staff these expanded operations.

External evaluations in addition to the one in 1985 will take place in 1987, 1989, and 1991 and are discussed in the Evaluation Plan (Section IV.E.).

B. Administrative and Monitoring Arrangements

1. A.I.D. Responsibilities

The USAID/Pakistan Office of Energy and Engineering (E&E) will have overall responsibility for managing the project. E&E is currently staffed with three U.S. Direct Hire (USDH) and thirteen Pakistani professionals. Candidates for one additional USDH position and one Pakistani professional position are under recruitment. One of the USDH positions is that of an Energy Advisor who will serve as the Project Officer for this project. An experienced FSN professional who has participated in all phases of the design of the project will serve as Deputy Project Officer. A JCC Forestry Advisor position has been requested in line with a recommendation of Dr. Nyles Brady, Senior AA/S&T.

It is estimated that the implementation of this project will require the equivalent staff time of 1 USDH and 2 FSNs to carry out A.I.D.'s responsibilities. The USDH staff time will be provided by the Project Officer, working on a part-time basis, plus a percentage of the time of the Chief of the Office of E&E, the Mission Director, Deputy Director, Regional Legal Advisor, Controller, and staff of the Offices of Agriculture and Rural Development, Program, Project Development and Monitoring, and Human Resources and Training. The efforts of these A.I.D. staff will be support-

by the JCC Forestry Advisor and a strong technical assistance team. (See Section IV.C.1.). The expatriate JCC in his capacity as Consultant/General Advisor will be responsible for, inter alia, the coordination of all activities undertaken by the technical assistance team and will work closely with and assist the GOP Project Director on a day-to-day basis to direct and orchestrate the activities of all agencies involved in implementing the project. In this way, the USAID Project Officer will thereby be able to devote his efforts to major program oversight responsibilities and liaison with senior GOP officials. Figure 5 graphically depicts the formal and informal relationships among A.I.D., the Project Contractors, the Office of the IGF, the PFI and the Provincial Forestry Departments.

E&E will be assisted in all contracting and procurement actions by the Mission's Office of Project Development and Monitoring, all disbursement matters by the Office of Financial Management, all evaluation and donor coordination activities by the Program Office, all training activities by the Office of Human Resources and Training, all logistic matters by the Office of Management, and all research and education coordination activities with agricultural universities and extension services by the Office of Agriculture and Rural Development. These Mission staff resources together with the assistance of AID/Washington backstopping staff in ASIA/TR, ASIA/PD, S&T/EY, SER/CM, SER/COM, and SER/DM and the Regional Legal Advisor (located in Islamabad), Environmental, Contracts and Commodity Management Advisors are considered adequate to meet USAID/Pakistan's responsibilities under the project.

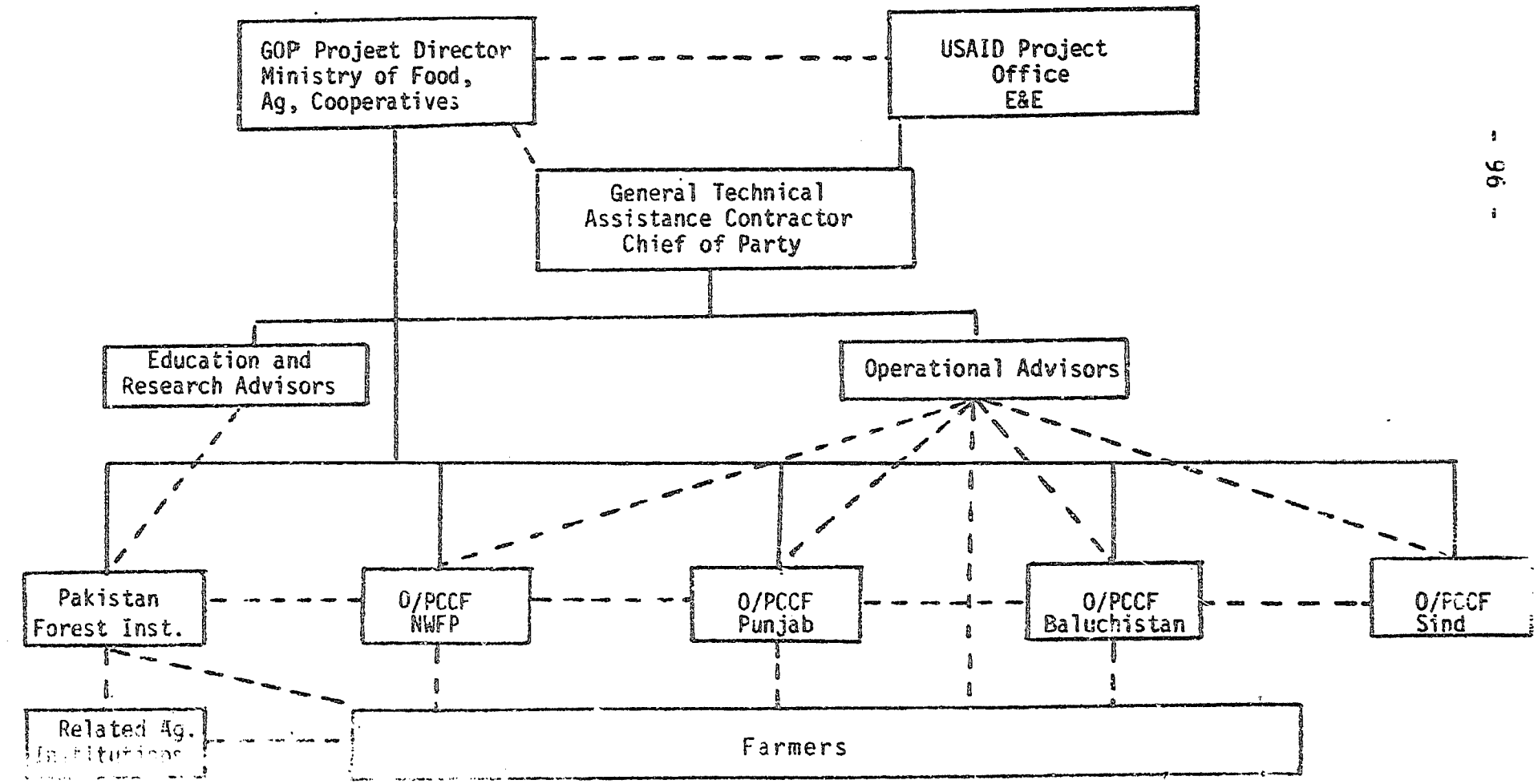
2. GOP Responsibilities

The lead GOP agency with responsibility for overall project implementation and management is the Office of the Inspector General of Forests (O/IGF) in the Ministry of Food, Agriculture, and Cooperatives (M/FAC). Although forestry itself is primarily a provincial subject, the designation of this project as a federal energy activity and the need to coordinate relevant aspects of forestry and energy policy require overall federal coordination. The O/IGF will be the principal point of contact with USAID/Pakistan at the federal level, with the Project Directors at the provincial level, and with the Pakistan Forest Institute. The O/IGF will have central coordination, monitoring and evaluation responsibilities, although field operations will be executed by the Provincial Forest Departments.

The coordination responsibilities of the O/IGF will include:

FIGURE 5

RELATIONSHIPS AMONG A.I.D., PROJECT CONTRACTORS, AND KEY GOP AND OTHER PAKISTANI IMPLEMENTING ENTITIES



a. ensuring rapid identification and timely release of trainees for overseas and in-country training;

b. overseeing the development and integration of the farm forestry curriculum at the PFI;

c. ensuring efficient and appropriate use of technical advisors;

d. ensuring the rapid dissemination of applied research results that bear on overall project direction;

e. preparing annual project budget proposals;

f. coordinating with the financial advisor in the M/FAC to facilitate the release of funds for project activities in the provinces and at the PFI; and,

g. consolidating and submitting reimbursement claims for rupee costs incurred by the participating provinces under the project.

At the provincial level, the Provincial Forest Departments will be the implementing agencies. The Chief Conservator of Forests will designate one senior member of his staff, probably with the rank of Conservator, to be the full-time Project Director for all activities within the province. He will be assisted in his administrative responsibilities by other staff members of the O/FCCF office. Senior staff officers with responsibilities for planning, monitoring, and evaluation and their subordinates will assist the Provincial Project Director in administering and conducting the project planning, monitoring and evaluation activities. Additionally, the staff responsible for farm and energy forestry will be significantly strengthened, both in number and in skills.

At the Pakistan Forest Institute, the Director-General will be the official responsible for implementing project activities in research and education, at least during the first several years of the project. Subsequently, he may wish to appoint one of the faculty members returning from training abroad as the administrator responsible for further project implementation activities.

As documented in the Administrative Analysis Section, the existing institutional mechanisms and available human resources coupled with the training and technical assistance to be provided under the project are considered adequate to meet the GOP's administrative and monitoring responsibilities under the project.

C. Procurement Plan

1. Technical Assistance

Table 12 and Figure 6 together present a summary and illustrative schedule of the full scope of technical assistance envisioned for the Forestry Planning and Development Project. All technical assistance exclusive of that required for external evaluations will be provided by one U.S. firm which will hire long and short-term expatriate consultants supplemented by sub-contracts with local universities.

Because of the eight year life of this project and its innovative character in Pakistan, the continuity of technical assistance personnel will be vital. To provide strong coordination and overall management of the consulting team, the Senior Farm and Energy Forestry Technical Advisor in the O/IGF will be designated as the Chief of Party (COP) and will supervise all consultants at the PFI and at the provincial level. At the end of the fourth project year, with the departure of the Senior FEF Technical Advisor and the initiation of federal and provincial planning efforts, the Policy and Planning Technical Advisor will assume the responsibilities of the COP. To ensure adequate coordination among operations, research, and training, the COP will convene and chair regularly scheduled project management meetings of senior technical assistance team members. The COP will report directly to the A.I.D. Project Officer in the Mission's Office of Energy and Engineering.

For the first two project years, the COP will assist the O/IGF and Provincial Farm Forestry wings of the Provincial Forest Departments to establish the groundwork and to initiate operational activities. Short-term technical assistants will provide support in socio-cultural and silvicultural aspects of project design. Initial training for the orientation of field staff will be the responsibility of the technical consultants at the PFI. After initiation of operational activities, technical assistance for the operational activities will be provided by a long-term consultant whose sole responsibility will be for this component. The COP will continue to coordinate the operational activities with the training and research components.

Continuity of training and research technical assistance will be provided by an overlapping series of two-year consultancies at the PFI over a five and one half year period. These consultants will come from universities with departments in fields relevant to farm and energy forestry. They will return approximately a year after their two-year tour of

TABLE 12

SUMMARY OF TECHNICAL ASSISTANCE

Category	Persons	Person-Months
1. Expatriate		
a. Long-term	6	207
b. Short-term a/	13	33
	19	240
2. Local		
a. Long-term	1	24
b. Short-term	3	9
	4	33
Total	23	273

a/ Includes eight consultants who will provide sixteen person-months of short-term technical assistance for evaluation.

duty for a short follow-up visit to evaluate the ongoing research and training and to assist the returning long-term trainees in assuming their new duties.

The periodic short-term assistance in socio-cultural analysis will support the ongoing management of operational activities. This assistance is also scheduled to provide timely information for each of the formal external evaluations.

Since the O/IGF has little prior expatriate contracting experience and currently has insufficient staff to prepare and adminster such contracts, A.I.D. will undertake all contracting for this project. The following mechanisms will be employed to procure the technical assistance required by this project:

a. a direct A.I.D. competitively awarded contract with a U.S. private firm for the duration of the project to provide the planning, policy and management team for the O/IGF and the provincial farm and energy forestry team. The contractor will be required to subcontract for certain long and short-term consulting assistance in the areas of policy, planning and socio-economic analysis. The contractor will also be required to procure project-related commodities as part of the scope of work. This will allow timely procurement in line with project progress. The private firm will

FIGURE 6

ILLUSTRATIVE TECHNICAL ASSISTANCE SCHEDULE

Nature of Technical Assistance	U.S. Fiscal Year							
	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
A. O/IGF (Expatriates)								
1. Senior Farm and Energy Forestry Advisor and COP a/			(45)					
2. Policy/Planning Advisor and COP						(42)		
B. Provincial Forest Department								
1. Expatriates								
a. Farm & Energy Forester					(48)			
b. Rural Sociologist/ Anthropologist	(6)							
c. Silviculturalist	(2)							
2. Local Socio-cultural Analysis		(24)		(3)		(3)		(3)
C. Pakistan Forest Institute (Expatriates)								
1. Farm Forestry Outreach		(24)			(3)			
2. Farm Forestry Systems (Biological)				(24)		(3)		
3. Resource Planning & Economics						(24)		(3)
D. Evaluation (Expatriates)								
Two Evaluation Specialists Each		(4)		(4)		(4)		(4)

Note: Parenthetical figures refer to the number of person months

a/ "COP" : Chief Of Party

also be required to provide, either through subcontracts or a joint venture with a university consortium, the technical assistance required for the training and research activities at the PFI.22/ The individuals recruited for these positions will serve overlapping two-year terms in Pakistan. It will be desirable to have the same individuals return for the short-term follow-up consultations. This will allow better identification, supervision and reintroduction of overseas trainees at the PFI and in the provincial research programs;

b. PSCs and/or IQCs will be utilized for the evaluation teams; and,

c. a direct A.I.D. contract with a local A&E firm to design and supervise the construction of a hostel/dormitory at PFI.

2. Commodities

The commodities provided in support of this project will be procured with grant funds from the project and with loan funds from the Agricultural Commodities and Equipment Program (ACEP) (391-0468). The respective amounts are estimated to be $1,621,000 from the project grant and $5,000,000 from the ACEP loan. Illustrative lists of the proposed items are included in Annex L. All commodities financed under both projects, with the exception of vehicles under the ACEP loan, will have their source and origin in either Pakistan or the United States. The type of equipment and procurement responsibilities are described below.

a. FP&D Project-Financed Commodities

The Mission will procure directly the household and office equipment required by the technical assistance consultants in order to ensure its timely availability. The General Technical Assistance Service(GTAS) Contractor will procure the printing, educational, and library equipment for the PFI after a needs assessment has been conducted by the TA consultant at the PFI immediately upon arrival in 1984. The equipment procured in this manner will be available to support the new farm forestry curriculum in 1986. This equipment will also be used to produce outreach materials for the operational activities and to publish research results. The GTAS will also procure small quantities of supplies required to support research activities over the life of the project.

22/ The Mission will also explore the possibility of utilizing the Joint Career Corps to meet the technical assistance requirements of the training and research conducted at the PFI.

Office equipment, light nursery equipment, and hand tools that are available in Pakistan will be procured by the Provincial Forest Departments in consultation with the GTAS and the A.I.D. Project Officer.

b. ACEP - Financed Commodities

The Mission will procure directly the vehicles required for field operations, research and the technical consultants. The vehicles are of two types. Approximately twenty-six (26) 4-wheel drive pick-up trucks will be required in field operations and research for the transport of field staff, equipment and seedlings. Approximately eight (8) 4-wheel drive vehicles with storage capacity for baggage and equipment will be required for Provincial Forest Department supervisory staff and for the technical assistance consultants. Vehicles for the TA consultants will be required by mid-1984 while all other vehicles will be needed by early 1985. Operation of all vehicles in rural areas and for long distance trips warrants the procurement of right-hand drive vehicles. Operation in remote areas will also require that the vehicles procured are of a make adequately supported by an in-country service network.

The tractors, nursery and watering equipment and field tools required for the initial field operations in Nasirabad and the Barani will most likely be procured by a Procurement Services Agent (PSA) selected in accordance with A.I.D. competitive procedures for host country contracting. These commodities will be required early in 1985 for the construction of nurseries and the initial planting and soil conservation work in 1986. Further equipment needs of this type will be identified by the GTAS as necessary and procured either by the Mission, the host country and/or a PSA.

The GTAS will also be specifically responsible for defining the needs for earthmoving and land levelling equipment in the Sind and for forestry research and analytical equipment. The actual procurement will be undertaken by the Mission, the host country and/or a PSA. The activities requiring this equipment will not commence until 1986 and beyond.

D. Training Plan

The training opportunities provided in support of each project component form the essential foundation for the long-term success of farm and energy forestry. Through a balanced combination of long-term and short-term overseas programs and a variety of in-country training programs, the project will strengthen the skills required by senior administrative, research, education and field staff. Table 13 provides a summary of the numbers of personnel to be trained and the duration of training. Annex O provides a summary, by project component, of an illustrative training plan to meet the needs of the forestry sector in Pakistan.

TABLE 13

SUMMARY TRAINING PLAN

Category	Persons	Person-Months
1. Overseas Training		
a. Masters Level	26	546
b. Non-Degree	22	66
c. Study Tour	80	40
Sub-Total	128	652
2. In-Country Training		
a. Degree Level		
i. B.Sc.	42	924
ii. M.Sc.	36	792
b. Non-Degree Short Courses	112	112
c. Study Tour	192	96
d. Farmer Training	30,000 a/	1,900
Sub-Total	30,382	3,824
Total	30,510	4,476

a/ The actual number of farmers trained will depend on the design of forestry outreach programs in the initial phases of the project. It is estimated that approximately 30,000 farmers will receive training.

Figure 7 presents a schedule for this training that is specifically designed to mesh with the availability of technical assistance and the staffing needs of the educational, research and operational activities. While the training program has been designed to meet a number of currently identified specific needs, it is recognized that during project implementation, new needs may become evident requiring some revision of the plan discussed below.

1. Office of the Inspector General of Forests and Related Ministries

The focus of training in this area is on the development of planning, policy analysis, monitoring and evaluation, and managerial talents required for a well-integrated national forestry program and for farm and energy forestry in particular. Because the federal forestry officials in Pakistan are responsible primarily for policy

FIGURE 7
ILLUSTRATIVE TRAINING PLAN SCHEDULE

Nature of Training	U.S. Fiscal Year							
	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
I. O/IGF & Related Ministries								
A. Long-Term Overseas								
1. Policy, Planning and Administration			(2)					
2. Farm & Energy Forestry		(1)						
B. Short-Term Overseas								
1. Management		(1)	(1)	(1)	(1)			
2. Monitoring and Evaluation	(1)	(1)						
C. Short-Term Incountry								
1. Planning and Management					(2) △	(2) △		
2. Farm & Energy Forestry	(4) △	(4) △	(4) △					
D. Asian Farm Forestry Study Tour	(7) o				(7) o			
II. Provincial Forest Departments								
A. Planning and Management								
1. Long-Term Overseas								
Planning, Policy & Administration			(4)					
2. Short-Term Overseas								
a. Management		(2)	(2)	(2)	(2)			
b. Monitoring and Evaluation	(4)	(4)						

Note: Parenthetical numbers indicate the number of trainees in each program.
"o" represents a two week program
"△" represents a one month program

FIGURE 7 (Continued)

Nature of Training	U.S. Fiscal Year							
	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
3. Short-Term Incountry Planning and Management					(16) △	(16) △		
B. Farm & Energy Forestry								
1. Long-Term Overseas								
a. Farm Forestry Systems & Management		(4)		(3)				
b. Resource Economics					(2)			
c. Irrigation and Hydrology		(1)						
2. Short-Term Incountry Farm Forestry	(16) △	(16) △	(16) △	(16) △				
3. Study Tour Overseas								
a. Asian Farm Forestry	(5) o				(5) o			
b. Asian Farm Forestry For Farmers			(20) o		(20) o			
4. Farmer Training (57,000 contact days)								
5. Pakistan Farm Forestry Tour		(24) o	(24) o	(24) o	(24) o	(24) o	(24) o	(48) o
C. Farm and Energy Forestry Research								
Long-Term Overseas				(4)				

Note: Parenthetical numbers indicate the number of trainees in each program.
"o" represents a two week program
"△" represents a one month program

FIGURE 7 (Continued)

Nature of Training	U.S. Fiscal Year							
	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
III. Pakistan Forest Institute								
A. Long-Term Overseas								
1. Forestry Outreach		(1)						
2. Farm Forestry Systems			(1)					
3. Planning & Resource Economics				(1)				
4. Silvics and Tree Improvement					(1)			
5. Ecology						(1)		
B. B.Sc./M.Sc. Farm Forestry Program				(42/36)				
C. Asian Farm Forestry Study Tour	(8) o				(8) o			

Note: Parenthetical numbers indicate the number of trainees in each program.
"o" represents a two week program
"Δ" represents a one month program

development, budget advocacy and coordination, training will emphasize short-term opportunities for senior and mid-level professionals. A limited number of overseas M.Sc. training slots are recommended to bolster the long-term retention and application of the desired skills among the federal forestry officials.

a. Three-month overseas management training courses will be provided for four individuals who will return to staff the O/IGF in support of the new farm and energy forestry unit and the proposed planning and policy development activities.

b. Three-month overseas training in monitoring and evaluation techniques will be provided for two individuals who will work under the AIGF to develop and implement the data collection and analysis procedures in the O/IGF necessary for effective program assessment and planning.

c. In the second half of the project, in-country management training will be provided to approximately four people who will work with the AIGF and the planning and policy technical assistant to develop an integrated national forestry plan.

d. Two M.Sc. level overseas training opportunities in policy, planning, and administration will be offered to provide O/IGF with a more solid grounding in these areas. These individuals, upon their return at the end of the fourth project year, will work with the AIGF and the planning and policy technical assistant in the O/IGF to develop an integrated national forest plan for forestry development on public and private lands.

e. Several short in-country training courses in farm and energy forestry will be given for staff of the O/IGF, the Ministry of Planning and Development, and other Ministries as appropriate. The function of these courses initially will be to familiarize senior federal officials with the management of farm and energy forestry programs and experience with these programs in other countries. Subsequent courses in this series will provide an opportunity for the same officials to learn from project experience and to orient new federal participants as necessary.

f. A study tour of farm forestry in Asia will be organized and conducted at least twice during the project. This tour will introduce the same officials in (e) above to the approaches to farm forestry undertaken in other Asian countries with similar conditions.

g. An M.Sc. level overseas training slot will be provided for a member of the new farm and energy forestry unit in the O/IGF. This person, who will return to Pakistan during the first year of planting, will assist the DIGF for Farm and Energy Forestry in providing oversight and guidance to provincial farm forestry programs.

2. Provincial Forest Departments and Farmer Training

Training for provincial forestry professionals will strengthen the planning and management capability of the Provincial Forest Departments and field operations in farm and energy forestry.

a. Planning, Policy and Management

i. M.Sc. level training will be offered to approximately four individuals who will return to staff the planning and evaluation units of the Provincial Forest Departments. Follow-up in-country short courses will be offered to sustain and strengthen these skills. The bulk of this training will be provided over the first four years of the project in order to have available trained staff for the provincial forestry planning efforts. Refresher in-country courses are scheduled during the fifth and sixth project years.

ii. Short overseas courses in management, monitoring and evaluation will be provided for up to twelve individuals in the planning and evaluation units and in the new provincial farm forestry organizations. All of this training will occur in the first four project years while the farm forestry operations are being planned and initiated.

b. Farm and Energy Forestry

i. M.Sc. level training will be provided for up to seven of the provincial farm forestry staff. The areas of emphasis for this training will include outreach program design, agroforestry systems, and management. The first group of four trainees will return during the first year of farm tree planting. The remaining three trainees will be available as the operational activities expand in the fifth and sixth project years. M.Sc. level training will also be provided for up to three Forest Department staff in technical subjects that support farm and energy forestry programs as well as overall forestry operations. These subjects will include resource economics and irrigation system design and operation.

ii. Up to ten provincial farm forestry staff will participate in the Asian Farm Forestry study tours described earlier.

iii. Approximately 64 farm forestry staff will be included in an ongoing series of in-country courses in farm forestry offered at the PFI over the life of the project. The purpose of these courses will initially be to orient the field staff and provide models for farm forestry program implementation. Subsequent courses could be used to disseminate the results of research and experience gained during the life of the project.

iv. In conjunction with the farm forestry short courses, an annual Pakistan farm forestry tour will be organized for farm forestry staff to exchange experiences and to build a shared sense of professionalism.

v. It is anticipated that farm foresters will actively participate as students in many of the courses organized for farmers at the tehsil level.

Training of farmers in the target areas of the Barani and Nasirabad will be initiated as soon as field operations start in the second project year. Training for farmers will be conducted at three levels. First, an intensive training series will be offered for village opinion leaders in combination with the local farm and energy forester. These individuals will provide the Forest Departments with guidance to help them organize local farm forestry programs that will effectively meet farmer needs. Additionally, if the training is successful, these individuals will play a vital role as motivators encouraging others in their villages to adopt farm forestry practices. These trainees will extend the efforts of the government farm forestry staffs and help define the local community's ownership of the program. Second, as an incentive to encourage these farmers' participation in the program and to expose them to experiences in other countries, Asian forestry tours will be organized for approximately 40 of these motivators. At the third level, extensive training programs will be offered to provide all interested farmers in project areas with knowledge about the advantages and disadvantages of farm forestry and to develop their skills in tree planting and management. The following summarizes the training to be provided to farmers:

i. training for approximately 400 to 500 motivators representing the 17 tehsils where project farm forestry operations will be located;

ii. two Asian farm forestry tours for approximately 40 local motivators; and,

iii. approximately 57,000 days of training to assist farmers in developing the skills to design and implement sound forestry plans for their individual farms.

c. Provincial Research

Four M.Sc. level training opportunities will be provided for research activities at the Gatwal research station in Punjab and the Miani research station in Sind. The areas of emphasis will include agroforestry ecology, socio-economic analysis, silviculture, and tree improvement.

3. Pakistan Forest Institute: Education and Research

Training for this sub-component supports the development of both educational and research capacity for farm and energy forestry. The training subjects and scheduling have been designed to mesh with the technical assistance plan. The technical assistants to the PFI will help to identify individuals with high potential and recommend them for overseas training. They will also assist them in establishing programs upon their return to the PFI and the Provincial Forest Research Stations. Several of the trainees will take over from the technical assistants the teaching of the courses in the farm forestry curriculum at the PFI. Because of the need to retain a close connection between the education of farm forestry staff and the results of research in the same field, there should be some overlap of teaching and research responsibilities.

a. Five M.Sc. level training opportunities for future teaching and research staff will be provided. The areas of emphasis include forestry outreach, farm forestry systems, and resource planning and economics. Additional areas of study in support of farm forestry will be silvics, tree improvement, and ecology. Upon their return, these trainees will take over teaching and research responsibilities in these areas with help, initially, from the appropriate technical assistant. Research conducted by these individuals will be coordinated by the Director General with the research activities in the Provincial Forest Departments.

b. A revised B.Sc. and new M.Sc. curriculum will be designed and implemented with help from the technical assistants at PFI. This curriculum will be the core of a farm and energy forestry specialization that is expected to include approximatley twelve students each year after 1985. The graduates of this program will help meet the staffing requirements of the farm forestry programs as they expand in the fifth and sixth project years.

c. Study tours will be conducted to expose PFI faculty and promising students to farm forestry programs in other Asian countries. An effort will be made to identify other farm forestry research groups.

4. Organization of Training

Selection of trainees for positions at the O/IGF and at the PFI in education and research will be primarily the responsibility of a selection committee comprised of the Director General of the PFI, the IGF, and the O/IGF Senior Technical Advisor. Typically, nominations will be received from the Provincial Forest Departments, which have traditionally supplied most of the manpower at the O/IGF and PFI on deputation. Technical advisors in various components of the project will play an important role in identifying promising candidates for both long and short-term overseas training. In the case of trainees in line for teaching and research positions, they will, when possible, study overseas in the departments of the technical advisors with whom they have worked in Pakistan. Overseas training in support of provincial research and operations will be managed in a similar manner. Logistical support and management of the overseas training component are expected to be handled by the long-term contractor under the A.I.D.-financed Development Support Training Project.

Development of in-country curriculum for long and short-term training and for study tours will initially be the responsibility of the technical assistance team working with their counterparts at PFI and in the Provincial Forest Departments. Over the course of the project, the technical assistance team members will shift responsibility for revision and delivery of these programs to their counterparts, particularly those returning from long-term training.

E. Evaluation Plan

1. General Discussion

Four formal external evaluations are planned over the life of this eight-year project, in August of 1985, 1987, 1989 and 1991. The evaluations will each require about 8 weeks of effort to review secondary source data, conduct interviews, and make field visits. The final evaluation in 1991 may include, in addition to the above methods of evaluation, the collection and analysis of primary source data. Applied socio-cultural research has been scheduled to coincide with these evaluations so as to provide timely information regarding the adoption of farm forestry practices.

All evaluations will be undertaken by individuals who are not directly involved in the implementation of this project to ensure objectivity, but representatives of all participating GOP and provincial ministries, agencies, and departments, Mission personnel, and the contractor's long-term resident staff will serve as valuable resources for the evaluation team. All evaluations will also require

the participation of AID/Washington personnel and either local and/or expatriate consultants. It is currently expected that representatives of the World Bank may also participate in the external evaluations so as to integrate project results with the Bank's anticipated Pakistan farm forestry program scheduled for 1987 or 1988. Depending on future developments, the Asian Development Bank and FAO may also participate. All formal evaluations will be conducted in cooperation with the Federal and Provincial Advisory Committees who will be responsible for effecting policy and program changes which may be required as a result of the evaluations.

In addition to these formal external evaluations, internal assessments are planned for every six months and will consist of program reviews by personnel directly involved in project implementation, including the USAID Project Officer, the expatriate COP, the GOP Project Director, Provincial Project Coordinators, and the long-term technical assistance staff. Other personnel from the GOP, USAID and the contractor's team may also attend these review meetings. Subjects to be reviewed during these meetings may include but will not be limited to: the status of contracting and procurement actions; progress achieved in implementing training programs; the outcome of demonstrations and studies and decisions taken as to how the results will be disseminated and acted upon; progress achieved in effecting planned organizational and institutional changes; the appropriateness and effectiveness of administrative arrangements; and, the effectiveness of key implementing organizations, expecially the O/IGF and the provincial farm forestry wings, in implementing the project. On the basis of these reviews, assessment reports will be prepared and distributed to relevant agencies and ministries. The O/IGF will be responsible to ensure that recommendations from these internal assessments are implemented. The regularly scheduled meetings of the Federal Advisory Committee will serve as a forum for project monitoring and informal project evaluations.

Ongoing, internal monitoring by A.I.D. and the GOP will generate a variety of data sources that will be of use in the external reviews. The strengthened monitoring and evaluation capacity in the O/IGF and the Provincial Forest Departments, which is a specific objective of this project, will be particularly useful for these evaluations. The sources of information will include:

a. periodic progress reports submitted by the technical assistance contractor;

b. minutes from meetings of the Federal Advisory and Provincial Steering Committees;

c. monitoring reports prepared by the O/IGF;

d. technical consultant reports on training plan design, the PFI curriculum, the forestry research plan, and the silvicultural assessment of Sind's Forest Plantations; and,

e. the socio-cultural baseline and follow-up studies in the farm forestry target areas.

2. 1985 Evaluation

The first evaluation in August of 1985 will immediately precede the first field planting season in the farm forestry target areas. While progress to this point will be measured principally in terms of inputs, there is, at this point, the opportunity to evaluate the adequacy of progress to date and, most importantly, review the proposed farm forestry outreach strategies. This evaluation will include attention to the following items:

a. the structure of institutional coordinating mechanisms and farm forestry organizations;

b. the adequacy of the level of staffing in the O/IGF and the farm forestry organizations to execute the proposed activities;

c. progress in the establishment of field facilities for farm forestry programs and the development of contacts with receptive farmers;

d. the "fit" between the socio-cultural baseline study and the forestry outreach strategies;

e. the proposed farm forestry curriculum and research plan at the PFI;

f. progress in training; and,

g. adequacy of disbursement mechanisms.

3. 1987 and 1989 Evaluations

These mid-course evaluations will provide the opportunity to refine the strategies employed in the farm forestry activities in light of the experience to date. The 1987 evaluation will occur after the first two planting seasons and should be able to assess the initial reaction to the approaches taken by the farm forestry organizations. It is at this point that the World Bank is expected to be in the design phase of its own farm forestry project for Pakistan.

This evaluation will provide a unique opportunity to mesh the objectives of the two programs and to ensure coordination of future activities. The 1989 evaluation will occur during what is anticipated to be a rapid growth phase in the adoption of farm forestry practices.

Specific items for consideration in these evaluations include:

a. the adoption of farm forestry practices and the success of the private nursery strategy;

b. the initial research results and the effectiveness of transfer to field operations;

c. the effectiveness of federal and provincial coordinating mechanisms and the integration of government plantation and farm forestry in Forest Department planning efforts;

d. review of proposed federal and provincial forestry policy initiatives;

e. the effectiveness of PFI farm forestry curriculum; and,

f. continuing progress in the training program.

4. 1991 Evaluation

The 1991 evaluation coincides with the completion of A.I.D. sponsored activities under this project. It thus serves as the terminal evaluation. However, it is anticipated that farm forestry in Pakistan will still be in a strong growth mode and that related activities will be proceeding under GOP and/or other donor sponsorship. The evaluation thus also serves an ongoing purpose. For A.I.D., this evaluation will provide an important opportunity to examine the lessons that may be applicable to other A.I.D.-supported forestry and rural development projects. Questions such as the following will be addressed during this evaluation :

a. To what extent have the farm forestry operations become self-supporting and which outreach strategies employed supported or hindered the outcome? This question may be posed in terms of the level of popular and/or government support for farm forestry.

b. What has been the impact of the project on cropping and land tenure patterns in the target areas? The availability of fuelwood? The use of cow dung for fuel? The level of tree cover? The balance of market versus subsistence oriented tree management?

c. To what extent have the Sind Forest Plantations targeted for assistance increased their profitability?

d. To what extent has the technical assistance and training program had a discernable impact on the project outcome?

e. Is the revised curriculum at PFI fully implemented? Is faculty quality sufficient to sustain it?

f. Has applied research in farm forestry filled the role envisioned for it as an integral part of project design, implementation, monitoring, and evaluation? To what extent have social and economic considerations been brought into forestry research in Pakistan? To what extent have forestry and agricultural research and outreach activities been integrated?

g. Has a process been established for the development and use of a national forest resource policy in guiding future federal and provincial forestry activities on public and private lands?

V. PROJECT ANALYSES

A. Technical Analysis

1. Institutional Capabilities and Manpower Development

This component of the project will introduce GOP officers in the forest sector to an integrated set of analytical and management skills. The new skills acquired through the project will strengthen the overall role of these institutions in the agricultural and energy sectors. The approach taken to providing these skills utilizes a coordinated package of technical assistance and short and long-term training. The initiation of farm and energy forestry activities under the operational component and a major provincial and federal forest planning and policy effort will provide opportunities to utilize and refine these new skills.

The officers of Pakistan's forestry institutions draw on a sound foundation of basic biological knowledge and experience as described in the Background Section. Over the past fifteen years, however, significant advances have been made in the application of financial, economic, planning and management techniques to forestry issues. A clear case in point is the evolution of the Resource Planning Act (RPA) process undertaken by the U.S. Forest Service. This process produces an integrated assessment of and plan for forest resources on both public and private lands. In addition, it has stimulated the development of sophisticated monitoring and evaluation techniques with which to manage ongoing programs and to measure progress towards planning goals. Planning and management techniques have also evolved in the course of farm forestry programs in other developing countries.

Substantial project resources are devoted to giving Pakistani foresters access to these new techniques. Short-term training and study tours are emphasized in order to maintain an applied focus in the learning process. This emphasis will also minimize the disruption of operations at the forestry institutions. Training will occur with the close support of long-term technical assistance to ensure continuity of effort. Long-term training will also be provided in order to introduce specific technical and analytical skills in greater depth. These would include, for example, financial and economic analysis, policy design, planning and management. Work during long-term training will emphasize topics of direct relevance to the forestry sector in Pakistan.

The development of a national forest sector plan for Pakistan is a practical way of focusing the skills developed through training and technical assistance on the development of a new

momentum for forestry programs. A similar approach in India and other countries resulted in a heightened awareness and strong consensus among leading government and private opinion leaders in support of farm forestry initiatives.

In summary, the proposed package of technical assistance, training and applied planning activity is a feasible method of putting in place an improved set of policy, planning and management skills in Pakistan's forestry institutions.

2. Farm and Energy Forestry Research

The research component is designed to build on a well-established program of basic forestry research in Pakistan. The research agenda developed during the project will be implemented through the existing coordination and review mechanisms established by the Pakistan Agricultural Research Council (PARC), the PFI, the O/IGF and the Provincial Forest Departments. With the assistance of technical consultants, stronger links will be forged between agricultural and forestry research. The development of a new relationship between forestry and agriculture is required if on-farm tree crop management is to realize its full potential in a manner that augments rather than impedes agricultural production. Strong support for this concept was expressed by the senior GOP officials with responsibility for both sectors. In addition, officials at the PFI, the Agricultural University at Peshawar and the Agricultural University at Faisalabad expressed interest in developing collaborative research programs. The University of Punjab at Lahore already conducts joint research with the Punjab Forest Department on rural sociological issues.

As indicated earlier in Sections II and III, the underpinnings of basic forestry research in Pakistan are sound. Thus, several of the research sub-components including tree improvement and species trials, the development of high quality seed sources, certain ecological studies, irrigation regimes and saline/waterlogged soil reclamation all fall within the scope of existing research skills. In these areas, project support will concentrate on technical assistance in research design and monitoring and on training additional research personnel. The establishment of the Gatwal research station by the Punjab Forest Department and the ongoing activities at the well-run Forest Research Station at Miani in Sind and at PFI all demonstrate that sufficient skills and commitment exist to make these types of research successful.

To ensure the relevance of project-supported research to other project components and the forestry sector in general, the research agenda will stress applied topics with a systems

perspective of the farm enterprise rather than the more general and basic research that has comprised the majority of forest research activity in the past. The O/IGF, the Director General of the PFI, and the project's COP will be responsible for coordinating research activities with the needs identified in farm forestry field operations. A crucial link in this cycle of problem identification, research, and adoption of new techniques is the dissemination of effective, applied research results among field staff and, in this case, farmers. This will be accomplished by two well-tested methods. First, the research staff, both Pakistani and technical consultants, will participate in the planned annual Pakistan farm forestry tour and the periodic short courses for Forestry Department staff. In addition, provincial research staff will be available to their colleagues who are field officers on an ongoing basis. Second, the project will provide equipment for production of educational materials to disseminate research results. The lack of this equipment currently places a severe limitation on the flow of forestry-related information in Pakistan.

In addition to the research topics discussed above, the project will support the addition of several new areas of research to the repetoire of forestry researchers. These new research areas will address essential economic and socio-cultural questions raised by the implementation of a national farm forestry program. The forestry sector traditionally has not had to deal intimately with social and economic questions but rather has focused research attention and management on the biological issues of forest management on government lands. However, in the course of the watershed afforestation programs over the past ten years, officials throughout the forestry sector have realized that, in fact, questions of social organization and forest product markets have great relevance. The interest and commitment to these new research endeavors were demonstrated by two groundbreaking Pakistani studies conducted in the Hazara Division of the NWFP that examined a wide range of cultural and socio-economic issues concerning tree planting programs on private lands and the development of a forest industry facility. With project support, the analytical skills employed in these reports will be developed further in the research units of the Provincial Forest Departments and at PFI. This will be accomplished primarily through the implementation of a research agenda emphasizing economic issues in the forestry sector, particularly the supply/demand situation for fuelwood and its related market structure, and on socio-cultural aspects of on-farm tree crop management.

The overall approach to the research component emphasizes applied research topics in both biological and socio-economic subjects; close coordination between researchers and field

staff in the identification of research priorities; and, rapid dissemination of useful research results. The institutional structure of a nationally coordinated forestry research program with strong provincial roles and links to field outreach activities is a model that has proven successful in other countries including the U.S.

3. Field Operational Activities

The need for and relevance of operational activities to demonstrate improved farm and energy forestry practices have been adequately demonstrated in the Background Section. This need relates principally to the increasing demand for fuelwood, particularly in rural areas; the decline in Pakistan's forest growing stock; and, the myriad of social, economic, and environmental issues resulting from these trends. A set of three distinct field operations have been designed for the Barani region of the Punjab and the NWFP, the irrigated farm district of Nasirabad, Baluchistan and the irrigated forest plantations in Sind. Site-specific field analyses were undertaken by the project design team to ascertain the technical feasibility of alternative approaches. A detailed description of the operational activities is included in Annex F, and further analysis can be found in technical consultants' reports on file with USAID/Pakistan and ASIA/TR/EFE. Technical considerations for project design can be considered in two groups, ecological/silvicultural aspects and agricultural/livestock aspects.

a. Ecological/Silvicultural Aspects

The criteria for the selection of appropriate tree species for farm and energy forestry operations must include the species' suitability for intended purposes, its tolerance to the likely growing conditions, and its adaptability to various management regimes. A wide variety of native tree species exist in Pakistan and additional species are under trial, particularly various polar clones, eucalyptus species, and ipil-ipil (*Leucaena*). However, *Acacia arabica*, or babul, has many useful characteristics that make it uniquely suitable for the production of fuelwood and energy on private farmlands. Most importantly, babul is a fast-growing, native species that is well known and accepted by farmers and foresters throughout all target areas. It is ecologically plastic and well adapted to the climatic, edaphic, and biotic characteristics of the target areas. Babul is leguminous (nitrogen-fixing) and is tolerant of saline and waterlogged soils. Babul is a preferred fuelwood, yields substantial quantities of timber for on-farm and commercial use, produces fodder, and is currently the only wood for mine timbers in Pakistan. Nursery and planting methods and direct seeding techniques are well developed. The Provincial Forest

Departments have had substantial experience in raising babul and are in a good position to transfer that knowledge to farmers and private nursery workers. Babul produces useful quantities of firewood and fodder within the first two to three years after planting and can be efficiently grown on rotations as short as eight years although farmers may, in many situations, opt to extend the growing period up to twenty years. In the absence of overriding requirements for specific characteristics (e.g., fruit production, special soil conservation treatments, or aesthetic plantings), babul is the outstanding species of choice for the target areas.

Over 70 alternative species and genera were considered for the project. A representative selection is presented in Table 14. However, none of them had the same combination of desirable characteristics as those described above for babul. The technical silvicultural report does identify a variety of specific roles for species other than babul, primarily in the areas of soil conservation, the reclamation of saline and waterlogged land, and larger scale industrial forestry. These will be pursued and investigated during project implementation.

A variety of management regimes featuring babul were developed to adapt to the wide range of climatic conditions and management objectives found in the project's target areas. Thus, the silvicultural models incorporate adaptations to water availability, land use, landholding patterns and the availability of labor. Harvesting patterns have been scheduled to provide, as much as possible, an even flow of material commencing early in the project. This feature was included in direct response to the needs of the small, low-income farmer for a rapid and continuous return on his family's investment of time and other resources. One model incorporates a ground fodder crop and a harvest regime based on lopping branches rather than thinning. As this model best meets the crucial object of fodder production and utilizes "indigenous" management methods, it was felt that the model would be received very positively by farmers. Although this model is biologically sound, it does depart from conventional silviculture and thus will be introduced on a limited scale and further tested early in the project.

Because forestry is an inherently conservative profession, the project design team has deliberately incorporated a margin of safety in yield estimations and has avoided reliance on species not well-known or accepted by farmers or the forest product markets in Pakistan. In the judgement of the project design team, each of the models is technically sound, feasible, and well adapted to local conditions on the basis of direct field observation, literature review, and extensive discussions with Pakistani foresters and farmers.

TABLE 14

SPECIES CONSIDERED FOR ALTERNATIVE FARM FORESTRY MODELS

Species	Products										Ecological						Uses		Growth			Propagation		
	Fuelwood	Charcoal	Poles	Farm Timbers	Mine Timbers	Industrial wood	Fodder	Medicinal	Gum	Tanin	Frost tolerant	Drought tolerant	Salinity tolerant	Waterlogging	Hard clayey soil	Salt absorbent	Soil Conservation	N Fixation	Rapid	Moderate	Slow	Seed	Shoot/root	Coppice
Acacia arabica	x	x		x	x	x	x		x	x			x	x	x		x	x	x			x		
A. modesta	x	x		x		x	x				x	x			x		x	x		x		x		
Albizzia lebbek	x	x				x	x					x	x		x		x	x	x			x		
A. Procera	x	x				x	x										x					x	x	
Ailanthus altissima	x					x	x										x					x	x	
Azadirachta indica	x		x			x	x	x		x	x	x							x			x		x
Casuarina equisetifolia	x		x	x						x	x		x	x			x		x			x		
Dalbergia sisso	x	x				x	x				x							x		x		x	x	
Eucalyptus spp.	x	x	x										x	x					x			x		x
Ficus palimata	x						x										x		x				x	
Leucaena leucocephala	x	x	x				x						x	x			x	x	x			x		
Melia azedarach	x						x	x			x	x								x		x	x	x
Morus alba	x					x	x												x			x	x	x
Populus spp.	x						x																x	
Prosopis cineraria	x	x					x						x					x			x	x		
P juliflore	x	x											x					x	x			x		
Robinia pseudacacia	x		x	x			x				x						x	x		x		x		x
Sesbania grandiflora	x						x		x				x	x				x	x			x		
Tamarix articulata	x						x					x	x	x			x		x				x	x
Zizyphus jujuba	x	x					x			x	x	x	x	x	x		x			x		x		x

Note: This table is extracted from the silvicultural technical report with AID/Pakistan and ASIA/TR. Over fifty other species and genera were reviewed and many recommended for trials in research. Scoring characteristics are general; many features vary with provenance (eg frost tolerance)

b. Agricultural/Livestock Aspects

The first tenet of farm forestry is to integrate tree crops with the efficient operation of the entire farm enterprise and to achieve the highest overall return, not necessarily the maximum wood production. Four issues are of particular concern to Pakistani farmers and agricultural policy-makers in this regard. These are:

i. positive and negative interaction between tree and conventional row crops;

ii. displacement of row crops from productive arable land following the introduction of tree crops;

iii. the substitution of firewood for dung fuels permitting the use of dung as a fertilizer and soil conditioner; and,

iv. the reduction of available grazing areas and the production of additional quantities of fodder from well managed tree crops and underplantings.

The issue of tree/crop interaction is raised most often by agriculturists. The project design team has incorporated this concern into the forestry models in the following manner. As discussed earlier, the species of choice for the farm forestry operations is a leguminous species, babul. The nitrogen-fixing ability of this species will serve to offset the potential growth impact from any nutrient competition. Model design has deliberately excluded any intercropping schemes for trees and row crops from the operational activities. Although there is evidence from other areas that successful versions of this approach exist, it was felt that sufficient scientific uncertainties and knownfarmer resistance warranted the designation of this approach to a research and demonstration status. Rather than intercropping, the models emphasize row planting along field berms and edges and block plantations on submarginal or abandoned agricultural land. The row plantings, in particular, can be designed in such a way as to provide beneficial wind breaks for rice, fruit and other crops. The management of row trees is an important determinant of the effect on adjacent crops. The models included in this project stress proper spacing, thinning, lopping and timely harvest to minimize the effects of shading and root competition. The role of the farm forester as technical advisor will be vital both to explain the means of avoiding negative tree/crop interaction and to assist the farmer in following an effective management schedule. These design elements will ensure that negative effects are minimized and that the feasibility of the approach is

maintained.

The displacement of row crops by trees on agriculturally productive land is not expected to be a problem in the project. The target populations of small farmers are very economically sensitive and relatively deficient in high quality agricultural land. The tree planting models emphasize the production of wood and fodder for on-farm use; commercial production is secondary. The strategy of farm forestry outreach programs will be to encourage tree planting on submarginal agricultural and eroded land that has gone out of production but which is nonetheless well suited for tree crops. Finally, the project incorporates limitations on the assistance to large landholders with the resources to plant large acreages of agricultural land with commercial tree species. For these reasons, the project is not expected to adversely affect overall agricultural production while still being able to gain access to sufficient, suitable land to render the project feasible.

A major benefit of the project will stem from the substitution of fuelwood for dung that is currently burned and thus lost as a fertilizer and soil conditioner. The project design team specifically investigated this issue during its field work. The team found that poor farmers, typifying the target population, were financially unable to purchase adequate supplies of chemical fertilizer although they were well aware of the benefits in yields. The farmers also expressed a desire to use more dung for fertilizer but were constrained by the lack or cost of alternative fuels. With the exception of certain specialized uses of dung fuel, such as yogurt-making, farmers expressed a willingness to use more fuelwood if it were readily available. Labor to collect and use dung as fertilizer will be made available by the labor savings in fuelwood collection resulting from on-farm production. Thus, realizing the expected benefits of fuelwood dung substitution is feasible.

A potential obstacle to the successful implementation of the operation is the threat to young trees represented by grazing livestock. Other forestry projects, particularly the watershed rehabilitation efforts, have attempted to preclude grazing from large, contiguous acreages. This has required the hiring of guards (chowkidars) and has, in some areas, effectively cut off grazing access for adjacent livestock owners. The results have been both reforestation failures as herders ignore grazing restrictions and the development of resentment towards Forest Department activities, a resentment Forest Departments can ill-afford. Recognizing the difficulty presented by this problem, the project design incorporates several elements to help overcome potential problems in this area. The farm forestry concept in this project stresses

the development of relatively small stands, planted and protected by the farmers themselves, that are fully integrated with the farm enterprise, geographically and operationally. By inculcating a stronger sense of ownership and responsibility, demonstrating the direct benefits to the farmer, and by reducing the management load, it is expected that farmers will be willing to protect the farm trees from grazing. Certainly, the low-income farmers that were interviewed expressed their willingness to do so. Furthermore, the farm forestry models discussed earlier incorporate the production of fodder as an explicit management objective from both the trees and grasses in the protected stand. Experience in similar World Food Program Projects indicates that once the fodder potential of the farm forest stands is demonstrated, landowners are willing to hand-cut fodder and stall feed their livestock at least until such time as the trees have grown out of reach (2-3 years). The physical integration of farm forestry with the farm operations will also make protection easier. Because the grazing problem is one of the most serious threats to farm forestry, the project will also test the use, where necessary, of incentives to farmers for protection of young trees although this will not involve taking over actual guard responsibilities.

4. Summary

In summary, all three project components are based on technically sound analyses, feasible methodologies, and analytical safeguards which assure prudent use of project funds.

B. Administrative Analysis

1. Office of the Inspector General of Forests(O/IGF)

Forest management in Pakistan has been almost entirely a government responsibility since before partition and consequently, the GOP has substantial experience in administering forestry programs. At the Federal level, the Office of the Inspector General of Forests (O/IGF) is the senior federal unit responsible for forestry activities. The IGF develops and recommends forest policies to the GOP; he coordinates and evaluates forestry activities in the provinces and supports provincial forest budgets within the Central Development Working Party (CDWP); he develops, justifies, and defends the federal budget for forestry actions; he coordinates all development planning for the forestry sector; and, he coordinates and promotes watershed management and the program to encourage the public to plant trees during Pakistan's two rainy seasons.

The Forestry Planning and Development Project will not broaden the scope of the administrative responsibilities of the O/IGF. However, it will intensify the magnitude of responsibility in a number of important areas. As discussed in the Project Description Section, slight modifications of the responsibilities of the two existing DIGF positions coupled with the designation and training of professional staff assistants will enable the O/IGF to administer effectively the policy, planning, monitoring, and evaluation activities of the FP&D Project while continuing to fulfill the ongoing obligations of the Office. However, additional staffing will be required to enhance the O/IGF's ability to absorb the administrative responsibilities encumbent in coordinating the farm and energy forestry activities in the provinces and at the PFI. This necessity has been discussed with the GOP, and it has been agreed that an Additional Inspector General of Forests will be installed in the O/IGF to serve as Director of the FP&D Project. These arrangements will ensure that the O/IGF has adequate capability to meet its administrative responsibilities under the FP&D Project.

Moreover, the project will facilitate a number of other arrangements and activities that will strengthen further the administrative capabilities of the O/IGF. First, the project proposes the establishment of a Federal Advisory Committee for Farm and Energy Forestry. Comprised of sub-cabinet level officials representing the ministries responsible for forestry, agriculture, planning and development, and energy as well as the Provincial Governments, this Committee will provide a vehicle for dialogue among the various ministries concerned with farm and energy forestry development.

The Committee will advise the O/IGF and the technical advisors regarding the design and implementation of an integrated forest plan that will be useful in determining the GOP's priority development activities in the forestry and fuelwood areas. Additionally, the Committee will provide its members the opportunity to learn about the potential contribution of the farm and energy forestry approach.

Second, the project will provide technical assistance, training, and computer equipment to assist the GOP in a series of coordinated and systematic analyses leading to the creation of integrated plans for farm and energy forestry development in Pakistan. Thus, for the first time, the O/IGF will have the background information and analyses necessary to identify the most promising farm and energy forestry development options and the means to communicate and demonstrate their importance to the GOP.

Finally, the project will provide short-term training opportunities in monitoring and evaluation skills for a small number of federal officials. This training will improve the O/IGF's ability to evaluate the development implications of ongoing activities and to use the information developed in the design and justification of new, revised, or expanded program proposals. In summary, the FP&D Project will substantially strengthen the O/IGF's abilities to administer forestry programs in Pakistan.

2. Provincial Forest Departments

While the O/IGF has responsibility for federal policy and planning and for coordinating and reviewing forestry in the Province, the administration and management of forestry in Pakistan has always been primarily a provincial responsibility. Within each Province, the Office of the Provincial Chief Conservator of Forests (O/PCCF) has responsibility for administering and managing the government forests. The PCCF oversees the design of forest plans for each management unit; he prepares provincial budgets for forestry; and, he monitors and evaluates forest management activities. Although the titles vary from province to province, each of the PCCFs is assisted in his duties by a number of well-qualified, senior professionals. In fact, extensive line organizations have been established to administer the activities of each of the Provincial Forest Departments in the management of the reserved government forests and the irrigated forest plantations. (See Section II.D.1.)

As in the case of the O/IGF, the O/PCCFs are relatively well-equipped to administer the policy, planning, monitoring and evaluation activities of the FP&D Project. Early on in the project, short-term courses will be offered to the senior provincial officials responsible for these activities to strengthen further their skills in planning, monitoring, and evaluation. Moreover, one professional from each province will be provided the opportunity to undertake overseas training in policy, planning, and administration early on in the project. The detailed planning activities supported by the project have been scheduled so that these individuals can be selected and trained and can return to Pakistan in ample time to assume major staff responsibilities for these efforts.

As discussed in Section III. C., however, a much greater strengthening of the Provincial Forest Departments will be necessary to enable them to administer adequately the farm and energy forestry field operational activities. In all cases, the PFD's have some experience with farm and energy forestry. The NWFP FD, for example, has considerable experience in working with farmers to plant trees on farmlands as part of its World Food Program-supported Watershed Management Program. Similarly, the Punjab FD has recently taken over the responsibility for managing the Water and Power Development Authority's (WAPDA) watershed stabilization activities and has initiated an experimental social forestry project to provide seedlings to the public. In fact, a small number of senior and mid-level officials exist in each of the provinces whose responsibilities currently include activities closely related to the farm and energy forestry activities that the FP&D Project will support. It is the interest and commitment of these officials that led to the development of the project proposal and suggested its real opportunity for success. However, because the FP&D Project will support both new approaches in this area and activities on a larger scale than those of the past, the PFD's will have to be strengthened if they are adequately to administer these activities.

Support will be offered to each of the Provincial Forest Departments to enable them to establish the staff structures necessary to administer and manage farm and energy forestry programs. This structure is discussed in detail in Section III.C.1.c. Analysis suggests that it will be necessary to provide long-term overseas professional training for 10 individuals who will work in support of the CF/FEFs in the various provinces. (See the Project Description and the Training Plan.) Additionally, short-term in-country training will be provided for 64 individuals who will work primarily at the district and sub-district levels in managing the farm

forestry assistance effort. Initially, the DIGF/FEF and the CF/FEFs will be assisted in the organization and management of their programs by two expatriate technical advisors in farm and energy forestry and by both expatriate and Pakistani advisors in the organization of local development programs. It is believed that this training and assistance will be adequate to enable the successful administration of farm and energy forestry operations in seven districts located in the Punjab, NWFP, and Baluchistan.

3. Pakistan Forest Institute (PFI)

Although the Provincial Forest Departments conduct some research, train junior forestry technicians, and offer limited short-term training opportunities for professionals, research and professional training for forestry in Pakistan is primarily the responsibility of the Pakistan Forest Institute (PFI). The PFI has extensive experience in administering educational and research programs in forestry. It has well-developed curricula for both the B.Sc. and M.Sc. levels in the traditional forestry areas. Moreover, it has extensive experience in managing research, including a large number of activities supported by U.S. PL480 funds.

However, several administrative difficulties currently hinder the development and implementation of a research and training program for farm and energy forestry. First, the PFI lacks well-trained permanent staff to develop programs in farm and energy forestry. Second, although all forestry research is coordinated by the Pakistan Agricultural Research Council (PARC), there is very little collaborative research between the forestry sector and the agricultural sector. Thus, researchers in each of these sectors fail to learn from those in the other, and, as a result, the advance of knowledge in farm forestry techniques is hindered. Third, there is very little delegation of responsibility for research programs to mid-level managers within the PFI, a problem compounded by a rapid turnover rate in staff and a lack of experience that the turnover rate contributes to.

Through a concerted program of training and technical assistance, the FP&D Project will contribute to resolving these problems. Over the course of the project, three expatriate technical assistants will each spend two years at PFI. These individuals will work with the Director General of PFI and its other faculty members to develop a curriculum and research program in farm and energy forestry. Long-term training overseas will be offered to 5 Pakistanis who will take over the responsibility for these activities at the PFI upon their return from abroad. In addition, overseas training will be offered to 4 professionals who will return to research posts in the Provincial Forest Departments. In return for their

training, these professional will each make a commitment to teach and/or conduct research for a period of 4 or 5 years. This commitment will provide at least some stability for the program thus established. These programs will be strengthened further in two ways. First, the project will provide allowances for these individuals to enable them to purchase research publications and attend occasional professional meetings and thus will make it more attractive for them to remain in these professional positions. Second, individuals trained in support of other federal and provincial components of the project will have the skills necessary to enable them to teach or conduct research in those areas if required at some point in the future.

Finally, in working with the Director General/PFI to develop a curriculum and research program in farm and energy forestry, the technical assistants will, as one of their first priorities, examine opportunities for collaboration with professional representatives of institutions involved in agricultural research and teaching. Institutional candidates for this collaboration include the Agricultural University at Peshawar, the Agricultural University at Faisalabad which is near the proposed Punjab Forest Department Research Station at Gatwal, and the National Agricultural Research Center in Islamabad. It is anticipated that this approach will lead to the development of collaborative teaching and research programs and to the sharing of knowledge between the agriculture and forestry sectors.

4. Overall Coordination

Overall coordination of this project will be the responsibility of the Office of the Inspector General of Forests within the Ministry of Food, Agriculture, and Cooperatives. The GOP will appoint a Project Director who is likely to be the same person as the Deputy Inspector General of Forests for Farm and Energy Forestry. The Project Director will be assisted by Project Coordinators in each of the provinces and at PFI. The likely coordinators in the provinces will be the Conservators for Farm and Energy Forestry while it is expected that the Director General will be the coordinator for PFI. Additional advice and guidance will be provided by the Federal Advisory Committee for Farm and Energy Forestry. With assistance from the technical advisors, these individuals will provide the overall coordination and administration of the project.

The project has been designed to make this administrative task as easy as possible. Activities have been phased so that the personnel who are currently available to the project will be able to administer it during its early years. Activities only expand significantly in the fifth and sixth

project years which will allow ample time to recruit and train the additional staff necessary to make the overall program a success. Finding these staff for training will not be a problem. Competition for entrance to the PFI and for positions in the PFDs is severe. Many well-qualified individuals are turned away each year. Additionally, within the PFDs themselves, there are many, relatively junior individuals who indicated their interest in farm and energy forestry to the project design team. The phasing of project activities and the coordination of training plans are discussed in further detail in Section IV.

In summary, effective and appropriate administrative mechanisms have been or will be established to meet the unique implementation requirements of this project. Although some modification of the existing management structure is envisioned and additional staff will be required, the organizations involved in the implementation of this project by and large have the required manpower, experience, and administrative systems to implement the project effectively. This competence will be enhanced under the project through the provision of training and technical assistance. The project is therefore considered administratively feasible and sound.

C. Social Soundness Analysis

1. Target Populations and Their Characteristics

This project has been designed to benefit primarily low income farm families who work small parcels of land in regions of below average agricultural productivity in Pakistan. As a whole, Pakistan has a per capita income equivalent to U.S.$325 per year. With 55 percent of the work force employed in the agricultural sector, which contributes only 30 percent of Pakistan's gross domestic product, the average per capita income in the agricultural sector is roughly U.S.$175 per year. While families working in the agricultural sector earn less on the average than their counterparts who work in other sectors of the economy, there are significant differences in income within the agricultural sector itself. In general, families who farm within the irrigated districts of the relatively fertile Indus Basin are much more prosperous than those who farm the rainfed plateaus known as the barani region. Although income data are not available on a geographically disaggregated basis, reported and observed differences in farm productivity and the use of credit and purchased inputs suggest that per capita cash incomes of the agricultural sector in the barani may be well below U.S.$100 per year. It is in this area where the great majority of the project's farm forestry field operational activities will be located. However, a small number of operational activities will be conducted with farmers of average rural income in Baluchistan's irrigated farm district of Nasirabad.

a. The Barani Region

Table 15 shows the estimated urban and rural populations of the 14 tehsils in the barani region where farm forestry field operational activities are planned. Taken as a whole, 70 percent of the population of this target project area lives in rural surroundings. However, if Rawalpindi tehsil, one of Pakistan's largest urban areas is excluded, more than 80 percent of the population of the remaining area is rural, a percentage well in excess of Pakistan's average of 72 percent.

Table 16 illustrates farm tenure and average farm size in the target districts of the barani area. The land tenure data suggest that approximately 90 percent of the farms in this region are worked by farmers who either own all of their land or who own some of their land and rent additional acreage from others to extend their productive capability. Although it varies from district to district, on the average, only about 10 percent of the farms are worked by tenants.

TABLE 15

ESTIMATED 1981 POPULATION OF TARGET AREAS IN THE BARANI BY PROVINCE, DISTRICT AND TEHSIL

Province	District	Tehsil	Population (000's persons) Urban	Rural	Total
NWFP	Kohat	Kohat	75	263	338
		Hangu	32	118	150
			107	381	488
	Karak	Karak		185	185
Totals NWFP			107	566	673
Punjab	Rawalpindi	Rawalpindi	966	333	1,299
		Gujar Khan	34	326	360
		Kahuta	10	242	252
			1,010	901	1,911
	Attock	Attock	93	321	414
		Pindi-Gheb	24	280	304
		Fatehjang	14	133	147
		Talagang	20	255	275
			151	989	1,140
	Jhelum	Jhelum	136	333	469
		Chakwal	44	322	366
			180	655	835
	Gujrat	Gujrat	214	529	743
		Kharian	142	516	658
			356	1,045	1,401
Totals Punjab			1,697	3,590	5,287
Totals Project Area			1,804	4,156	5,960

TABLE 16

FARM TENURE AND SIZE IN THE BARANI TARGET AREAS BY DISTRICT

District	No. of farms	Tenure (Percent)			Average Farm Sizes (Acres)			
		Owner	Owner and Tenant/a	Tenant	All	Owner	Owner and Tenant	Tenant
Kohat and Karrak	48,342	60	29	11	7.8	6.6	10.9	6.7
Rawalpindi	124,430	64	24	9	6.4	5.6	9.4	25.1
Attock	91,511	45	35	19	14.6	14.8	16.4	10.9
Jhelum	74,283	54	40	5	11.9	11.8	12.5	8.9
Gujrat	118,802	52	37	11	9.7	8.9	10.7	10.2

/a : This category designates a farmer who rents land, in addition to his own, to operate as part of his farm.

Average farm sizes in the districts of the barani region vary from 6.4 to 14.6 acres. However, as Table 17 demonstrates, by far the majority of the farmers own considerably less than the average size parcel. The number of farm families owning less than 7.5 acres of land varies from 40 percent in Attock District to 70 percent in Rawalpindi District. These relatively small farm sizes are an outgrowth of the organizational structure of people living in this region. Here, the significant organizational units involved in village level activities are: (i) the family; (ii) the biraderi or lineage; and, (iii) the zat or caste. Small parcels of cultivable land are typically owned by the family unit. However, decision-making and economic cooperation regarding agricultural land are primarily functions of the lineage whose families often participate together in farming and related activities. In fact, the lineage often controls land considerably in excess of that reported as the sum of its families' holdings which often reflects only the prime cultivable land held by the biraderi.

b. Nasirabad District

As in the barani area, the population of Nasirabad District is predominantly rural with 90 percent of its people living in a rural setting. (See Table 18). Land

TABLE 17

DISTRIBUTION OF HOLDINGS IN THE TARGET AREAS OF THE BARANI (NWFP AND PUNJAB), BY SIZE CLASS

(In Percent)

Size Class (Acres)	Kohat & Karak	Attock	Rawalpindi	Jhelum	Gujrat
0-2.5	25	14	34	15	12
2.5-5.0	22	12	21	16	16
5.0-7.5	14	14	15	15	20
7.5-12.5	20	21	17	23	30
Over 12.5	19	39	13	31	22
Total	100	100	100	100	100

TABLE 18

POPULATION OF TARGET AREAS IN NASIRABAD, 1981

Tehsil	000's persons			Total Farmers (000's)
	Urban	Rural	Total	
Jhat Pat	7	151	158	25.0
Usta Muhammad	12	94	106	16.0
Dera Murad Jamali	9	34	43	5.6
Total	28	279	307	-

tenure patterns, however, are quite different in this district from those found further north in the barani. Working on almost 50 percent of the farms, tenants play a much more significant role in agricultural operations in Nasirabad, and 70 percent of the land is owned in parcels larger than 12.5 acres. (See Tables 19 and 20) This difference stems from the social characteristics of the tribal populations who migrated to Nasirabad from Baluchistan with the introduction of canal irrigation in the late 1930's and again with its expansion in the 1960's. Farmers in Nasirabad have strong roots in tribes such as the Jamalis and Brahuis and retain much of the social organization characteristic of their native areas. In these social structures, the responsibility for supplying factors of agricultural production and the rights to the fruits of that production are shared and managed through the local tribal organization. As a result, strong interdependencies between owners and tenants ensure that the benefits of agricultural activity are shared.

2. The Feasibility of Farm and Energy Forestry - Will Farm Families Adopt the Proposed Practices?

The farm and energy field operational components of the FP&D Project have been designed to respond to requests made by farmers that the Provincial Forest Departments provide

TABLE 19

FARM TENURE AND SIZE IN NASIRABAD DISTRICT /a

No. of Farms	Tenure (percent)			Average Farm Sizes (acres)			
	Owner	Owner and Tenant /b	Tenant	All	Owner	Owner and Tenant	Tenant
21,394	33	15	49	55.6	79.2	79.5	31.1

/a This data is taken from the 1972 Agricultural Census of the Kacchi District of Baluchistan which contained most of what is now Nasirabad.

/b This category designates a farmer who rents land additional to his own to operate as part of his farm.

TABLE 20

DISTRIBUTION OF HOLDINGS IN NASIRABAD BY SIZE CLASS a/

Size Class(Acres)	Percent
0-2.5	3
2.5-5.0	4
5.0-7.5	8
7.5-12.5	15
Over 12.5	70
Total:	100

a/ Taken from the 1972 Agricultural Census of Kacchi District in Baluchistan which contained most of what is now Nasirabad.

them with trees to supplement their farm productivity. Interviews conducted by the project design team with farmers at a variety of locations in the barani and Nasirabad confirmed high interest among the lower income farmers in planting multi-purpose trees that produce fodder, fuelwood, and timber. These farmers further recognized the important value to them intrinsic in substituting fuelwood for cow dung to free up the latter for use as fertilizer and soil conditioner. In the barani where many farmers lose significant quantities of cultivable land each year from gully erosion, considerable enthusiasm was also expressed for tree planting in combination with soil conservation measures to slow or stop these losses. The project has been designed to assist these low income farmers in achieving these objectives. It has not, however, been designed to assist primarily the wealthier farmers who own large parcels of land. Interviews with these landowners suggested interest exclusively in growing trees for commercial purposes, particularly to produce edible fruit or wood for industrial markets such as match manufacturing. Although these farmers were willing and could devote larger acreages to tree planting, most felt that the project should provide both the seedlings and the labor to plant, maintain, and protect the growing trees, and none was really interested in producing fuelwood. Most of the lower income farmers, on the other hand, expressed the willingness of themselves and their

families to plant, maintain, and protect small stands of trees for on-farm use if the seedlings could be made available at no charge. The project is consistent with this willingness of the lower income farmer to participate in this manner. Project funds will be used to purchase seedlings for distribution to farmers willing to participate and will provide training and technical advice to assist them in planting and maintaining them properly.

The project is also compatible with other features of the social landscape of the barani and Nasirabad. First, the project is designed to assist the family and the joint family in planting trees on privately-owned lands, not to assist the community in planting trees on communal lands. Past experience with cooperative agricultural endeavors in Pakistan (excluding credit and marketing cooperatives) suggests that this latter approach seldom succeeds. This conclusion was confirmed by a recent World Bank project in Azad Kashmir that assisted farmers in planting trees on shamlat or communal lands. Once planted, the "real" and socially acknowledged owners of these lands, who tended to be the wealthy, came forward to claim the benefits from the trees that were produced.

Second, the project will use the biraderi or lineage system to the best advantage possible. In the early stages of project implementation, a team of Pakistani anthropologists will work with an expatriate advisor to identify the local individuals who serve as the informal opinion leaders within the village. Typically, these opinion leaders will be senior individuals in the village's important biraderi groups. The project will encourage these individuals to adopt the desired farm forestry practices and will, where possible, hire them as local motivators to encourage both the families of their biraderi and the senior members of additional biraderi to follow suit. Thus, outside change agents (i.e., the farm forester and the media materials prepared and distributed through the project) will make people aware of the opportunities of farm and energy forestry while an inside and respected opinion leader will help the people evaluate and subsequently adopt the desired practices. As Everett Rogers' classic study of innovation stresses, this approach to encourage change is most often the successful one.23/

The focus on the family and the biraderi is also expected to help in resolving the grazing problem. As noted above, the lower income farmers interviewed by the project design team

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23/ Everett Rogers, A Theory of Innovation, 1962.

expressed their willingness to restrict the grazing of their livestock while the seedlings are being established. This task will be much easier to accomplish if other members of the biraderi are also participating and the herding and fodder collection required can be shared.

The project's prospects for success are also strengthened because of the relatively high advantages it offers to participating farmers and its compatibility with many of their ways of life. The project will not only provide fuelwood for family use and timber that can be used on the farm or sold to bring in extra income, but it will also : produce much needed fodder (both in the leaves of the trees themselves and also in increased grass production beneath the trees); free up cow dung for use as fertilizer (the largest economic contribution of the project); and slow the loss of agricultural land through erosion in the barani and through waterlogging in Nasirabad. These advantages are integral to the farm enterprise, and when fully realized, are likely to generate strong momentum for the project. This momentum will be enhanced by the ready visibility of the results and by the farmer's ability to plant a small number of trees on a trial basis to experiment with these activities, himself, before undertaking them more extensively. This outcome has occurred in a similar project in the terrai of Nepal.

Another factor suggests the project's probable success. In both Nasirabad and the barani, significant quantities of land exist that have gone out of agricultural production. In the barani, this has occurred because of the migration of men to the cities and the Middle East where they earn wage incomes. In Nasirabad, this has occurred because of waterlogging and salinity increases on irrigated lands. In both cases, this abandoned agricultural land is suitable for tree crops and is located conveniently near ongoing farm enterprises.

Finally, field interviews in the barani suggest a growing role of women in family decisions, a trend occurring because the exodus of men to work as remittance laborers in the Middle East has increased the relative influence of women in most families as well as the responsibilities that they have to carry out on the farm. Since they are the ones responsible for fuelwood and dung collection, fuel drying, and livestock care, they are apt to be the most eager to produce a secure source of fuel and fodder readily accessible from their homes.

3. Beneficiaries

Tables 21 and 22 summarize the expected direct and indirect benefits and beneficiaries by project component. The project's most immediate, direct beneficiaries will include the 18,000 farm families (roughly 108,000 people) on whose lands the operational and research components will be conducted. Design of the field components of the project has been specifically tailored to meet the needs of these farm families. The farm forestry models are designed to be an integral part of small farming operations, with minimal requirements for cash input. On-farm labor provided by owners, women and tenants can easily supply all requirements with the exception of soil conservation activities which will be subsidized. The resulting increased fuelwood supplies will generate a net savings of farm labor, particularly women's labor. It is roughly estimated from field observations and review of the available literature that the time spent collecting fuelwood could drop from an average of three hours per family per day to about one-half hour per day. Another major benefit will be the reduction in the use of animal dung as a heating and cooking fuel. Substituting fuelwood for dung will not only result in improved domestic sanitation, but will also free dung for use as fertilizer. This substitution will either reduce the cost of overall farm inputs, increase productivity, or most likely both.

The project has been designed to ensure that the poorer farm families who own small parcels of land will benefit from the project to the maximum extent possible. Design features that contribute to this objective include the project's emphasis on providing fuelwood and fodder species to meet subsistence needs and the project's primary location in the barani where agricultural productivity is low, farm sizes are small, and the distances from markets make the commercial sale of timber and fuelwood difficult. In this region, local tradition allows tenant farmers to lop the branches of trees on the landlord's property. Thus, tenants could benefit from as much as 30 to 40 percent of the fiber produced on lands planted by their landlord. In Nasirabad, the tribal alliance will ensure at least this much sharing between landlords and tenants.

Additional beneficiaries will include the rural labor hired by the private sector to establish and maintain seedling nurseries and construct soil conservation works. By the end of the project, 650,000 man-days per year will be required for seedling production alone. Soil conservation over the life of the project will require an additional 66,000 man-days of labor while nursery construction will create 10,000 man-days of work opportunity. The Forest Departments whose members will develop new skills and extend their responsibilities

TABLE 21

PROJECT BENEFICIARIES BY PROJECT COMPONENT

Project Component	Beneficiary Category										
	Farmers		Fuel Users	Rural Labor	Private Industrial Timber Consumers	Forest Departments					
	Small	Large				Federal	Pakistan Forest Institute	NWFP	Punjab	Sind	Baluchistan
1. Institutional and Manpower Development	X	X	0	-	0	X	X	X	X	X	X
2. Forestry Research	0	0	0	X	0	0	X	X	X	X	X
3. Operational Activities											
a. Barani (Punjab and NWFP)	X	-	0	X	-	0	0	X	X	-	-
b. Nasirabad, Baluchistan	X	X	0	X	X	0	0	-	0	0	X
c. Sind	-	-	X	X	X	0	0	-	-	X	0

X = Direct Beneficiary
0 = Indirect Beneficiary
- = No Effect

TABLE 22

EXPECTED PROJECT BENEFITS BY PROJECT COMPONENT

Project Component	Benefit Category								
	Improved Forest Skills				Fuel-wood supplies	Increased Timber Supplies	Water-shed Quality	Agricultural Productivity	
	Policy	Planning	Outreach	Tree Crop Management				Crop	Fodder
1. Institutional and Manpower Development	X	X	X	X	0	0	0	0	0
2. Forestry Research	0	X	X	-	0	0	0	0	0
3. Operational Activities									
a. Barani (Punjab and NWFP)	0	X	X	-	X	X	X	X	X
b. Nasirabad, Baluchistan	0	X	X	-	X	X	-	X	X
c. Sind	0	X	X	X	X	X	-	-	-

X = Direct Benefit
0 = Indirect Benefit
- = No Effect

will also be prime beneficiaries. Additionally, off-farm fuelwood consumers will benefit in areas adjacent to the Sind plantations and where fuelwood in excess of that required by the farm family is produced in the barani or Nasirabad. If, as expected, the project satisfactorily demonstrates the technical and economic success of expanded tree crop management, farmers, fuelwood and timber consumers, and rural labor throughout Pakistan could benefit from the development activities indirectly stimulated by this project.

Finally, this project will enhance the lives of rural women. The production of fuelwood for subsistence purposes in the barani and Nasirabad regions will reduce both the time spent and the distances travelled by women in the collection of fuelwood and dung for heating and cooking. In urban areas provided wood by the Sind Forest Department, prices of fuelwood should be lower than they otherwise would have been, which will reduce fuelwood expenditures and increase disposable income for other purposes. Women will also benefit directly from project inputs. The labor requirements of this project for nursery workers, seedling transport, and conservation works will generate employment opportunities and increase incomes in rural areas. Furthermore, while men are the traditional wage earners in Pakistani society, this project will create wage-earning opportunities for rural women. Women have, in the past, worked at home to plant seeds for the production of seedlings. The project will expand this activity. Efforts will also be made to encourage the establishment of nurseries in settings where women, who choose, could be the primary nursery staff.

4. Summary

In view of the above analysis of the socio-cultural acceptability and impact of forestry planning and development in Pakistan, this project is deemed to be socially feasible and sound.

D. Economic and Financial Analysis

This section addresses three interrelated economic and financial issues. First, each of the individual farm and energy forestry models is examined to determine whether it can be expected to yield a sufficient return to warrant being implemented. Second, the field operational component of the project is examined as a whole to determine whether the collective investment by A.I.D., the GOP, and farmers receives an adequate return. Finally, the potential contribution of the overall project to Pakistan's economy is considered. In the first two cases, the internal rate of return (IRR) is the criterion applied. In the third situation, the examination is more qualitative.

In each of the three analyses that follow, every effort has been made to use conservative assumptions. For example, despite the fact that the real price of timber and fuelwood in Pakistan has outpaced inflation by more than three percent per year over the past decade and all indications suggest that it will continue to do so,24/ only 1983 prices have been assumed to accrue to the fuelwood and timber produced by the project. Similarly, only producer prices have been assumed for the value of the wood produced despite the fact that in many cases, the farm families' only alternative is to purchase wood at the retail price which may be three or more times the producer value. Consequently, the results of this analysis are conservative. There is a very high probability that returns at least as good as those described for the farm models will accrue to the project.

1. Enterprise Analyses

As described in the Project Description Section and in Annex F, six farm and energy forestry models have been designed to meet the needs and opportunities confronted in the various regions in which the project will operate. Four of these models have been designed for application in varying ecological zones in the barani; one has been designed for Nasirabad; and, one for the Sind. Except in the case of the Sind, all of the models are intended to be implemented by the individual farm family. For the Sind, the model focuses on the provincial forest plantations. The aim of the farm forestry models is to encourage and assist the farm

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24/ This situation is not unique to Pakistan. For example, wood prices in the United States have risen at a real rate of 1.5 percent per year since the turn of the century and are rising at rates considerably in excess of that today. See: U.S. Forest Service, Timber Situation in the United States, 1980.

family to produce sufficient quantities of fuelwood to meet the family's domestic energy needs for heating and cooking. If successfully implemented, these activities will increase farm incomes and reduce the labor required for collecting and drying inferior fuel. Also, for many farm families, producing sufficient fuelwood to meet their energy needs will release the cow dung currently being used for energy purposes for use as fertilizer and organic conditioner. Neglecting its s il conditioning effects entirely, Kernan 25/ concluded that the economic value of a family's annual consumption of cow dung to meet its energy requirements would be Rs 1030 if used instead as fertilizer.

For each sub-region where the project will operate, a technically sound farm forestry model has been designed. The acreage required, the number of seedlings necessary, and the labor and other factors of production needed have all been determined based on the goal of achieving fuelwood self-sufficiency for the nuclear family. However, these farm forestry activities will also produce small quantities of timber and fodder as well. In actual application, the size of the woodlot and its economic management will be determined based on analysis of the individual farm enterprise. Each farm will have a different combination of needs; proximity to suitable wood markets will vary; and, the opportunities for alternative uses of land and labor will differ. Consequently, the amount of land and labor which can be invested in tree growing in a financially sound manner will vary. Farm foresters for this project will be trained to analyze the opportunities for tree crop management to assist the farmer in integrating them into the overall farm enterprise.

Table 23 summarizes the six models and illustrates the differences among them given several different assumptions regarding the revenues and costs of the activities. The key assumptions in the models include the following:

a. Land is available for planting trees. The opportunity cost associated with using the land is the loss of fodder production.

b. The annual family energy needs for domestic purposes can be met by 180 cubic feet of wood.

25/ Kernan, H. The Economics of Farm and Energy Forestry in Pakistan, June 1983. Report prepared for USAID/Pakistan Forestry Planning and Development Project (391-0481).

TABLE 23

CHARACTERISTICS OF SIX FARM AND ENERGY FOREST MODELS

Region	Zone	Type	Acres Required/ Family	Seedlings Required/ Family	Total Revenues and Costs (000's Rs)			
					Base Case a/		Fertilizer Credit b/	Free Seedlings c/
					Costs	Revenues	Revenues	Costs
Barani	Semi-Humid	Block or Row Equiv.	1.1	1320	5.4	13.8	29.0	4.1
		Block W/ Fodder Prod.	1.3	430	9.9	23.4	35.5	9.5
	Semi-Arid	Block or Row Equiv.	1.5	1800	5.6	13.8	29.0	3.8
	Dry Semi-Arid	Block or Row Equiv.	3.0	3600	8.1	13.9	29.0	4.5
Nasirabad	Irri-gated	Block or Row Equiv.	1.0	1320	5.3	13.9	29.2	4.0
Sind	Irri-gated	Block	1.0	Seeding	14.6	29.0	-	-

a/ Assumes farmer pays all costs and does not capture any fertilizer benefits from cow dung freed from energy consumption.

b/ Assumes family is currently using cow dung to meet 100% of its domestic energy needs and that the use of fuelwood makes this dung available for fertilizer.

c/ Assumes (as is the case) that the project will provide seedlings at no cost to the farmer.

c. The value of fuelwood to the family (and to the Sind Forest Department) is Rs 10 per maund (1 maund = 3 cubic feet or 40 kilograms). This is a conservative assumption since it reflects the price the farmer could get for selling wood. In fact, he would have to pay between 25 and 30 rupees per maund to purchase it.

d. Approximately one-half rupee worth of leaf fodder is produced for every cubic foot of wood that is grown.

e. The opportunity cost of a person's labor is 15 rupees per day in the barani, 20 rupees per day in the Sind, and 25 rupees per day in Nasirabad and will not increase for the life of the project.

f. The real price of timber, fuelwood, and fodder will not increase over the life of the project.

g. Seedlings cost 1 rupee each.

h. Ten percent of the seedlings must be replaced to achieve adequate survival.

Table 24 shows the revenues, costs, and net revenues that would accrue to each model over the twenty year rotation during which the trees would be expected to be productive. This table includes all costs including the cost of seedlings that will be supplied at no cost to the farm family by the project. It does not, however, assume that the farm family receives any benefits from freeing up cow dung used for energy purposes for use as fertilizer.

Table 25, on the other hand, shows the revenues, costs, and net revenues that would accrue to the model if the family currently uses cow dung to meet 100 percent of its domestic energy needs and is able to use the dung as fertilizer, as fuelwood becomes available to replace its use for energy. This table, and the summary table that follows, demonstrate the importance that the farm forester and the village motivators must place on encouraging farmers to grow trees to make their dung available for use in crop production. In fact, the value of the dung as fertilizer exceeds the producer price value of the fuelwood and timber produced.

Table 26 summarizes the real internal rates of return that will accrue to each model under a variety of assumptions. The base case assumes that the farm family must pay for the seedlings and that it receives no benefits from freeing up cow dung for use as fertilizer as would be the case if the family currently burns gathered fuelwood or straw. In this case, the real internal rates of return vary from 8 percent in the dry semi-arid region where both the soils and the

Table 24

ANNUAL REVENUES, COSTS, AND NET REVENUES OF ON-FARM TREE CROP MODELS - BASE CASE [a]

Region	Zone	Type	Revenue/ Cost Category	Year (Year 1 = Year Planted)																			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Barani	Semi Humid	Block or Row Equiv.	Revenue	30	20	20	175	180	180	930	930	930	930	930	930	955	955	955	990	990	990	1010	817
			Costs	1605	45	45	75	75	45	240	240	240	240	240	240	240	240	240	270	270	270	300	210
			Net	-1575	-25	-25	100	105	135	690	690	690	690	690	690	715	715	715	720	720	720	710	607
		Block W/ Fodder Prod.	Revenue	0	480	480	480	630	630	630	630	630	630	630	630	730	730	730	730	730	730	730	17850
			Costs	889	397	397	397	442	442	442	442	442	442	442	442	472	472	472	472	472	472	472	937
			Net	-889	83	83	83	188	188	188	188	188	188	188	188	258	258	258	258	258	258	258	16913
	Semi-Arid	Block or Row Equiv.	Revenue	20	20	20	185	160	170	930	930	930	930	920	920	920	920	920	985	985	985	985	985
			Costs	2190	45	45	75	45	45	240	240	240	240	240	240	240	240	240	270	270	270	270	270
			Net	-2170	-25	-25	110	115	125	690	690	690	690	680	680	680	680	680	715	715	715	715	715
	Dry Semi-Arid	Block or Row Equiv.	Revenue	45	20	20	160	160	160	920	920	920	920	920	920	920	920	920	1010	1010	1010	1010	1010
			Costs	4365	45	45	60	60	45	240	240	240	240	240	240	240	240	240	255	255	255	255	255
			Net	-4320	-25	-25	100	100	125	680	680	680	680	680	680	680	680	680	755	755	755	755	755
Nasirabad				45	45	45	195	195	195	920	920	920	920	920	920	940	940	940	970	970	980	980	980
				1370	45	45	75	75	45	240	240	240	240	240	240	240	240	240	270	270	300	300	300
				-1325	0	0	120	120	150	680	680	680	680	680	680	700	700	700	700	700	680	680	680
Sind	Irri-gated	Block	Revenue	0	30	30	970	0	0	3250	0	0	10240	0	30	30	970	0	0	3250	0	0	10240
			Costs	6135	320	210	570	190	190	830	190	190	1550	280	320	210	570	190	190	830	190	190	1550
			Net	-6135	-290	-180	+400	-190	-190	+2420	-190	-190	+8690	-280	-290	-180	+400	-190	-190	+2420	-190	-190	+8690

a/ Assumes farm family pays the cost of the seedlings and receives no benefits from increased availability of cow dung for fertilizer.

Table 25

ANNUAL REVENUES, COSTS, AND NET REVENUES OF ON-FARM

TREE CROP MODELS WITH FERTILIZER BENEFITS [a/]

Region	Zone	Type	Revenue/ Cost Category	Year (Year 1 = Year Planted)																			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Barani	Semi-Humid	Block or Row Equiv.	Revenue	30	20	20	398	455	455	1960	1960	1960	1960	1960	1960	1985	1985	1975	2020	2020	2020	2040	1847
			Costs	1605	45	45	75	75	45	240	240	240	240	240	240	240	240	240	270	270	270	300	210
			Net	-1575	-25	-25	353	380	410	1720	1720	1720	1720	1720	1720	1745	1745	1735	1750	1750	1750	1740	1637
		Block W/ Fodder Prod.	Revenue	0	480	480	480	888	888	888	888	888	888	888	888	1159	1159	1159	1159	1159	1159	1159	18980
			Costs	889	397	397	397	442	442	442	442	442	442	442	442	472	472	472	472	472	472	472	937
			Net	-889	83	83	83	446	446	446	446	446	446	446	446	687	687	687	687	687	687	687	17943
	Semi-Arid	Block or Row Equiv.	Revenue	20	20	20	443	400	428	1960	1960	1960	1960	1960	1960	1960	1960	1960	2015	2015	2015	2015	2015
			Costs	2190	45	45	75	45	45	240	240	240	240	240	240	240	240	240	270	270	270	270	270
			Net	-2170	-25	-25	368	355	383	1720	1720	1720	1720	1720	1720	1720	1720	1720	1745	1745	1745	1745	1745
	Dry Semi-Arid	Block or Row Equiv.	Revenue	45	20	20	373	373	400	1950	1950	1950	1950	1950	1950	1950	1950	1950	2040	2040	2040	2040	2040
			Costs	4365	45	45	60	60	45	240	240	240	240	240	240	240	240	240	255	255	255	255	255
			Net	-4325	-25	-25	313	313	355	1710	1710	1710	1710	1710	1710	1710	1710	1710	1785	1785	1785	1785	1785
Nasir-abad	Irriga-ted	Block or Row Equiv.	Revenue	45	45	45	487	487	487	1950	1950	1950	1950	1950	1950	1970	1970	1970	2000	2000	2010	2010	2010
			Costs	1370	45	45	75	75	45	240	240	240	240	240	240	240	240	240	270	270	300	300	300
			Net	-1325	0	0	412	412	442	1710	1710	1710	1710	1710	1710	1730	1730	1730	1730	1730	1710	1710	1710

a/ Assumes farm family currently uses cow dung for 100% of its domestic energy requirements and that this dung is used for fertilizer as wood becomes available to replace its use for fuel.

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Table 26

FARM AND ENERGY FORESTRY
ENTERPRISE RETURNS

Region	Zone	Type	Internal Rate of Return		
			Base Case a/	Fertilizer Credit b/	Free Seedlings c/
Barani	Semi-Humid	Block or Row Equiv.	19%	33%	47%
		Block W/ Fodder Prod.	24%	35%	33%
	Semi-Arid	Block or Row Equiv.	15%	28%	45%
	Dry Semi-Arid	Block or Row Equiv.	8%	18%	29%
Nasirabad	Irrigated	Block or Row Equiv.	21%	37%	53%
Sind	Irrigated	Block	12% d/	-	-

a/ Assumes farmer pays all costs and does not capture any fertilizer benefits from cow dung freed from energy consumption.

b/ Assumes family is currently using cow dung to meet 100% of its domestic energy needs and that the use of fuelwood makes this dung available for fertilizer.

c/ Assumes (as is the case) that the project will provide seedlings at no cost to the farmer.

d/ Alternating cash flows require that this value be an MIRR rather than an IRR. The risk rate and safe rate employed in this analysis were 15 and 6 percent, respectively.

people are the poorest to 24 percent in the more highly productive semi-humid zone where blue panic grass is grown for fodder production beneath more widely spaced trees. These real rates of return compare favorably with alternative investments available to the farmer. For example, Government of Pakistan Defence Savings Certificates yield a nominal compound rate of return of 15 percent per year if held for ten years. If it is optimistically assumed that inflation will be only 7 percent per year over the next ten years, the Defence Savings Certificates will yield a real rate of return of 7.5 percent compounded annually.

The second column in Table 26 shows the real internal rates of return that would accrue to the farm family if it is currently using cow dung for fuel and the availability of fuelwood allows the family to use this dung as fertilizer. In this case, the real internal rates of return range from 18 percent in the dry, semi-arid zone of the barani to 37 percent in the Nasirabad District of Baluchistan. The final column in Table 26 shows the real internal rate of return that farmers participating in the project will receive since they will be supplied the seedlings free of charge. In this case, which assumes no benefits from increased fertilizer availability, real internal rates of return vary from 29 percent in the dry, semi-arid zone of the barani to 47 percent in the semi-humid zone, also of the barani.

In short, the internal rates of return to the proposed project activities are high, even given conservative assumptions. From an economic perspective at least, the proposed project activities will provide more than adequate returns to the farm family's investment and effort.

2. Analysis of Farm and Energy Forestry Field Operational Activities from a Project Perspective

While it is important to examine the financial viability of each proposed tree crop management scheme from the perspective of the farmer, it is also essential to consider the overall financial viability of the project's field operational component. In this section, the financial viability of the operational component taken as a whole is examined. Table 27 illustrates the number of acres to be planted with each model in each year. Table 28 shows the costs incurred by A.I.D. and the GOP at current prices in support of the farm and energy forestry field operational component of the project. By combining this information with the information given in Table 25, the total net cash flow, including costs borne by A.I.D., the GOP, and the farmers, can be computed. The total net cash flow for the farm and energy forestry field operational component of the project is given

Table 27

TARGET ACREAGES BY MODEL TYPE AND YEAR

Region	Zone	Type	Acres Planted/Year					
			1986	1987	1988	1989	1990	1991
Barani	Semi-Humid	Block or Row Equiv.	74	232	453	685	1243	1333
		Block W/ Fodder Prod.	15	30	75	105	180	195
	Semi-Arid	Block or Row Equiv.	168	588	1260	2016	3528	4362
	Dry Semi-Arid	Block or Row Equiv.	35	140	350	630	1123	1555
Nasirabad	Irrigated	Block or Row Equiv	60	180	360	540	1050	1150
Sind	Irrigated	Block	50	150	150	200	200	200

Table 28

A.I.D. AND GOP EXPENDITURES FOR FARM AND ENERGY FORESTRY OPERATIONAL COMPONENTS a/

(In Rs Millions)

	Year							
	1984	1985	1986	1987	1988	1989	1990	1991
A.I.D.	4.5	2.1	6.7	7.5	9.6	11.1	11.4	13.1
GOP	1.7	8.3	8.3	8.5	9.2	9.6	10.0	10.0
Total	6.2	10.4	15.0	16.0	18.8	20.7	21.4	23.1

a/ Adapted from Tables K-2 and K-3 in Annex K. Assumes present costs for project activities. (The Financial Plan assumes 15% per year inflation in these costs)

in Table 29. The real internal rate of return inherent in this cash flow is 20.5 percent. Compared with the 12 percent nominal interest rate charged on loans provided to Pakistan by the World Bank (IBRD), the overall field operational component of the project appears to be a very sound investment.

Table 29

TOTAL NET CASH FLOW BY YEAR FOR FARM AND ENERGY FORESTRY FIELD OPERATIONAL COMPONENT a/

(In Rs Millions)

Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
1984	- 6.2	1993	20.9	2002	72.3
1985	- 10.4	1994	31.6	2003	76.6
1986	- 15.1	1995	43.6	2004	76.7
1987	- 16.2	1996	54.0	2005	99.8
1988	- 19.2	1997	65.2	2006	119.6
1989	- 21.0	1998	65.5	2007	185.7
1990	- 21.4	1999	66.2	2008	223.8
1991	- 22.4	2000	67.8	2009	325.6
1992	11.3	2001	68.4	2010	325.5

a/ Includes operational costs incurred by A.I.D., GOP, and farmers. Assumes fertilizer benefits are achieved.

3. Contribution to Pakistan's Economy

As demonstrated above, the returns to the field operational component of the project are expected to be substantial. However, they represent only a small portion of the overall benefits expected. After all, the primary purpose of the project is to enhance the capabilities of Pakistan's forestry institutions to work with the public to produce trees for the indefinite future. Only if this project and related efforts are successful will the contribution of wood to Pakistan's economy be increased. Without this project and related activities, reduction in Pakistan's limited forest inventories will almost certainly continue. If this occurs, deforestation will accelerate, the contribution of fuelwood to Pakistan's energy supplies will diminish, the productivity of agricultural lands will erode, and overall environmental degradation will occur.

Wood and trees play a major role in Pakistan's economy. According to the Pakistan Forest Institute, roughly 90 percent of the rural population and 50 percent of the urban population use traditional fuels including wood, cow dung, and crop residues to meet their domestic energy needs. Fuelwood, alone, provides about one-half of the domestic sector's total energy needs. Each year, almost 190 million maunds or 16 million cubic meters of fuelwood is consumed in Pakistan (1 maund = 40 kilograms). At Pakistan's average retail fuelwood price of 27 rupees per maund, this quantity would represent a total annual contribution to Pakistan's gross national product of 5 billion rupees if all fuelwood were exchanged through commercial channels. Even at an on-farm value of 10 rupees per maund, the annual fuelwood production is worth about 1.9 billion rupees per year.

However, even these values do not tell the whole story. For example, retail kerosene costs between one and one-half and two times the retail price of fuelwood in Pakistan. If Pakistan's total fuelwood consumption were to be replaced with this fuel, the cost of energy for the domestic consumer would increase by at least 75 percent. That is, it would cost the country nearly 9 billion rupees to replace the fuelwood that currently would sell for 5 billion. Moreover, because fuelwood is an indigenous product but kerosene has to be imported, this hypothetical displacement would represent a substantial drain on Pakistan's foreign exchange. At today's prices, that drain would total about 5 billion rupees.

Another way to perceive the role of fuelwood is to consider its substitutability with cow dung. In rural areas, cow dung is the fuel that people turn to when fuelwood is no longer available in sufficient quantities to meet their energy needs. Today, farm families burn agricultural waste, including dung, in quantities equivalent to 12 million cubic meters of wood. If all the fuelwood burned in Pakistan today were to be replaced with cow dung, farmers would have to purchase 3.2 billion rupees worth of fertilizer to accommodate this loss.

Clearly, fuelwood will not be entirely replaced by either kerosene or cow dung in the near future. However, according to the Pakistan Statistical Yearbook (1979) and a September 1982 survey conducted by A.I.D. at 43 locations throughout Pakistan, fuelwood prices have increased by a factor between 4 and 5 over the last decade and have more than doubled in real terms. (See Table 3 in Section II.) Consequently, inhabitants in the rural areas, in fact, are turning to cow dung and less desirable crop residues while urban dwellers must indeed rely to an increasing extent on kerosene.

The rising price for fuelwood reflects both rising demand for this important energy resource and a real decrease in actual wood supplies. Both population increases and the rapidly rising prices for imported petroleum products, particularly kerosene, contribute to the increasing demand for fuelwood resources. Pakistan's population is growing at a rate of about 3 percent per year; and, despite the fuelwood price increases of the past decade, fuelwood is still considerably cheaper than kerosene in Pakistan. At the same time, however, the fuelwood resource base is shrinking. The fuelwood harvest in Pakistan now exceeds 16.3 million cubic meters of wood annually while total harvest of wood from Pakistan's forests (fuelwood and other forest products) exceeds 16.6 million cubic meters. The annual growth of wood in Pakistan is approximately 11.3 million cubic meters per year. Thus, the annual growth of wood fiber in Pakistan equals less than 70 percent of the amount harvested. Consequently, Pakistan's inventory of wood resources is declining.

As discussed in Section II., trees and the wood they provide contribute in other ways to Pakistan's economy. In 1978/79, Pakistan exported 10 million U.S. dollars (130 million rupees) worth of wood products. At the same time, however, Pakistan imported 65 million U.S. dollars worth of pulp, paper, and round and sawn timber. Unless deforestation is reversed, this deficit will continue to increase. Wood also provides the mine timbers essential for Pakistan's growing coal mining

industry; and tree crops, when properly managed, help reduce the siltation of watersheds and thus contribute directly to extending the lives of Pakistan's essential hydroelectric reservoirs.

At present, Pakistan's federal and provincial decision-making bodies are not well-positioned to make wise decisions regarding the development of Pakistan's forest and fuelwood resources. They do not have the data nor analytical information necessary to judge the merits of forest and fuelwood developments against those of importance in other sectors. Similarly, they lack the information necessary to determine which specific investments in forest and fuelwood development will make the most desirable contributions to federal and provincial development. Finally, the forestry institutions of Pakistan lack the basic knowledge of farm and energy forestry systems and the experience in applying them, both of which are essential to reversing the decline in the nation's productive forest base.

The project, through its enhancement of institutional capability, its research, and its demonstration components will contribute to the data, the knowledge, the analytical skills, and the experience necessary to remedy these shortcomings. Quantifying the potential future impact of the overall project on the economy of Pakistan is clearly a speculative endeavor. The final outcome will depend on many things: farmer enthusiasm; the success of the demonstrations; the development of techniques using trees to increase agricultural production; Government support; Forest Department interest; and so forth. However, some insight can be gained by examining one possible scenario of the saturation of on-farm tree crop management techniques.

In its eight year life, the FP&D project can be conservatively expected to assist 18,240 farmers plant trees on between one and three acres each in order to produce wood to meet their own needs for fuelwood and small supplemental quantities of timber. Working with four-tenths of one percent of Pakistan's farmers on marginally productive rengelands, the project will stimulate the production of almost 0.1 million cubic meters of wood per year. Combined with the fodder produced, this wood will have a retail market value at today's prices of roughly 40 million rupees per year. Additionally, cow dung worth as much as 12 million rupees per year will be made available for use as fertilizer. Additional benefits will include increases in agricultural production from proper tree management, reductions in soil erosion and consequent reductions in the loss of agricultural land and the siltation of critical reservoirs, as well as aesthetic values.

If, with their improved skills and experience, the Forest Departments were able to encourage 20 percent of Pakistan's farmers to adopt on-farm tree crop management strategies adequate only to achieve fuelwood self-sufficiency for themselves, 5 million cubic meters of wood would be produced annually, which, in combination with the fodder produced simultaneously, would have a retail market value of 2 billion rupees per year. If all of these farmers are currently using cow dung for fuel, the value of the fertilizer thus released for agricultural production would total 600 million rupees per year. In fact, agricultural statistics and the field work conducted by the project design team suggest that sufficient land, labor, and interest exist to enable many, if not most, farmers to plant several times as much acreage as that required to satisfy their own fuelwood consumption. If 10 percent of the farmers in Pakistan were to plant enough trees to meet their own needs while 10 percent were to plant twice that much, wood worth 3 billion rupees per year would be produced. Combined with the fertilizer benefits described above, the total annual contribution to Pakistan's economy would be about Rs 3.6 billion, an amount slighly in excess of one percent of Pakistan's Gross Domestic Product.

If this scenario were to occur, and, if it were assumed that the value of the wood to the families involved was only the producer value, the incomes of the roughly one million farm families involved would be increased by a total of about 1.8 billion rupees per year. This amount on average, is equivalent to 10 to 15 percent of the cash incomes of these families.

4. Summary and Findings

In summary, the economic and financial analyses indicate that this project is financially sound, economically advantageous, and justified. It has substantial potential to benefit the lower income rural farmers of Pakistan.

E. Financial Plan

1. General

The total estimated cost of the project over its eight year life is $44,300,000, consisting of a $25,000,000 ESF grant provided by A.I.D., a $5,000,000 loan under the FY 1983 Agricultural Commodities and Equipment Program (ACEP) (391-0468), and a contribution by the GOP equivalent to $14,300,000. The GOP contribution is part of a larger farm and energy forestry program identified in its Sixth Five-Year Plan. A portion of the additional funds in this GOP program could be available for expansion of field activities if warranted by early successes in the project. It is also anticipated that these funds will provide counterpart funding for additional donor supported forestry activities over the next five years.

The two tables on the following pages provide a summary of project costs by project component, expense category and source of funding (Table 30) and by fiscal year, expense category and source of funding (Table 31). Additional details, including a summary of anticipated expenditures by fiscal year, are provided in the Financial Plan Annex (Annex K). Project costs as used in Tables 30 and 31 are defined as anticipated earmarkings or commitments of funding through, for example, PIOs, PILs, contracts or purchase orders. The effect of inflation on project costs was calculated on the basis of three annually compounded rates: 10 percent on all U.S. consultant salaries; 15 percent on all other foreign exchange costs, local salaries, and equipment operating and maintenance costs; and, 20 percent on all other local costs. A contingency factor of approximately 8 percent was applied to the A.I.D. project costs and to the estimated GOP contribution.

The planned obligation schedule for the FP&D Project grant of $25.0 million is as follows: FY 1983 = $7.0 million; FY 1984 = $3.0 million; FY 1985 = $7.0 million; and, FY 1986 = $8.0 million. The illustrative financial plan reflects the facts that: (i) the major long-term technical assistance contract will be initially funded in FY 1983 for a period of two years, with subsequent increments to be provided in two-year tranches; (ii) all long-term training must be fully funded (in PIO/Ps) at least six months prior to the initiation of training; and, (iii) funds for offshore commodities must be in place at least nine months prior to the expected arrival of commodities in-country. All GOP support is shown as a series of annual commitments in the fiscal year preceding the actual anticipated expenditure.

TABLE 30

SUMMARY OF PROJECT COSTS BY PROJECT COMPONENT

EXPENSE CATEGORY AND SOURCE OF FUNDING (in $ 000)

Project Component a/	Life of Project Funding				
	AID Grant b/			GOP c/	Grand Total
	FX	LC c/	Total		
1. Institutional and Manpower Development					
a. Technical Assistance	4341	1837	6178	-	6178
b. Training	1477	837	2134	490	2804
c. Commodities	348	368	716	-	716
d. Other Costs	-	523	523	543	1066
Sub-total	6166	3565	9731	1033	10764
2. Farm and Energy Forestry Research					
a. Technical Assistance	691	313	1004	-	1004
b. Training	404	-	404	98	502
c. Commodities	120	-	120	-	120
d. Other Costs	-	164	164	1358	1522
Sub-total	1215	477	1692	1456	3148
3. Field Operational Activities					
a. Technical Assistance	1556	505	2061	-	2061
b. Training	-	570	570	-	570
c. Commodities	-	785	785	178	963
d. Other Costs:					
i. Barani	-	5391	5391	6540	11931
ii. Nasirabad	-	832	832	1554	2386
iii. Sind	-	1501	1501	2277	3778
iv. Construction	-	279	279	231	510
Sub-total	1556	9863	11419	10780	22199
4. Evaluation	206	168	374	-	374
TOTAL	9143	14073	23216	13269	36485
Contingency	703	1081	1784	1031	2815
GRAND TOTAL	9846	15154	25000	14300	39,300

a/ Inflation = 10% on FX Salaries; 15% on all other FX costs, local salaries and vehicle operating and maintenance costs; and 20% on all other local costs. Inflation compounded annually.

b/ Does not include a $ 5.0 million loan for commodities under the Agricultural Commodities and Equipment Program (391-0468) in FY 1983.

c/ Expressed as dollar equivalents at the exchange rate of US $1.00 = Rs 12.83.

TABLE 31

SUMMARY OF PROJECT COSTS BY EXPENSE CATEGORY, SOURCE OF FUNDING AND FISCAL YEAR

(in $000)

Expense Category a/	1983		1984		1985		1986		1987		1988		1989		1990		1991		TOTAL b/		
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	Total
A. AID Grant Funds																					
1. Technical Assistance	1009	385	-	-	2169	764	-	-	2601	1002	-	-	809	504	-	-	-	-	6588	2655	9243
2. Training	179	148	332	-	474	335	501	-	313	482	82	-	-	442	-	-	-	-	1881	1407	3288
3. Commodities	222	384	-	-	119	280	-	-	75	355	-	-	52	134	-	-	-	-	468	1153	1621
4. Other Costs	-	566	-	-	-	743	-	-	-	2021	-	-	-	5360	-	-	-	-	-	8690	8690
5. Evaluation	-	-	-	-	38	24	-	-	45	30	-	-	56	48	-	-	67	66	206	168	374
Sub-total	1410	1483	332	-	2800	2146	501	-	3034	3890	82	-	917	6488	-	-	67	66	9143	14073	23216
5. Contingency	109	113	26	-	215	165	39	-	233	299	6	-	70	499	-	-	5	5	703	1081	1784
Total	1519	1596	358	-	3015	2311	540	-	3267	4189	88	-	987	6987	-	-	72	71	9846	15154	25000
B. GOP Funds c/																					
1. Training	-	-	-	49	-	103	-	147	-	106	-	71	-	56	-	56	-	-	-	588	588
2. Commodities	-	-	-	-	-	-	-	-	-	-	-	-	-	64	-	114	-	-	-	178	178
3. Other Costs	-	190	-	966	-	1137	-	1358	-	1711	-	2051	-	2375	-	2715	-	-	-	12503	12503
Sub-total	-	190	-	1015	-	1240	-	1505	-	1817	-	2122	-	2495	-	2885	-	-	-	13269	13269
4. Contingency	-	15	-	79	-	96	-	117	-	141	-	165	-	194	-	224	-	-	-	1031	1031
Total	-	205	-	1094	-	1336	-	1622	-	1958	-	2287	-	2689	-	3109	-	-	-	14300	14300
C. TOTAL																					
1. AID	1519	1596	358	-	3015	2311	540	-	3267	4189	88	-	987	6987	-	-	72	71	9846	15154	25000
2. GOP	-	205	-	1094	-	1336	-	1622	-	1958	-	2287	-	2689	-	3109	-	-	-	14300	14300
GRAND TOTAL	1519	1801	358	1094	3015	3647	540	1622	3267	6147	88	2287	987	9676	-	3109	72	71	9846	29454	39300

a/ Inflation = 10% on FX Salaries; 15% on all other FX costs, local salaries and vehicle operating and maintenance costs, and 20% on all other local costs. Inflation compounded annually.

b/ Does not include a $5.0 million loan for commodities under the Agricultural Commodities and Equipment Program (391-0468) in FY 1983.

c/ Expressed as dollar equivalents at the exchange rate of US $1.00 = Rs 12.83.

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2. Summary Cost Estimates and Financial Plan

a. A.I.D. Contribution

The A.I.D. contribution to the project will be provided from two sources; an ESF grant of $25,000,000 and a $5,000,000 loan under the ACEP. Approximately 39 percent of the grant funds will be used to meet the foreign exchange requirements of the project including technical assistance costs, overseas training, and certain equipment and commodities. A.I.D. will finance the international travel costs of participants enrolled in training programs of one year or less in duration. A participant training travel waiver, which exempts the GOP from having to cover these costs, has been signed by the USAID/Pakistan Mission Director and is included as Annex G. The remaining 61 percent of the grant will be used to meet local costs associated with field and research operations, facility construction, local commodities, and other non-GOP staff local expenses. To the maximum extent possible, A.I.D. grant funds which are used to finance local costs will be disbursed in U.S. dollars in order to maximize the balance of payments impact of this program in accordance with the overall objectives of the renewed USG-GOP economic and development assistance program. A FAA Section 612(b) certification has been signed by the USAID/Pakistan Mission Director and is included as Annex C.

Table 32 presents the proportional distribution of grant funds by project component and expense category. This table does not include the loan funds to be provided under the ACEP. The ACEP loan will be used to provide field vehicles (jeep and pickups), land clearing and leveling equipment, nursery equipment, surveying instruments and research equipment.

b. GOP Contribution

The GOP contribution to the project is equivalent to $14,300,000. Table 33 presents the proportional distribution of GOP funds by project component and expense category. Most GOP support is devoted to the staff required for project implementation, administrative support and the operating and maintenance costs of vehicles and equipment. The GOP will also purchase a limited quantity of commodities available in Pakistan consisting mostly of hand tools for field work. The GOP will cover the international travel costs for all training programs over one year in duration.

3. Recurrent Costs

The project entails certain recurrent costs which will have to be met if the farm and energy forestry activity

TABLE 32
DISTRIBUTION OF A.I.D. GRANT FUNDS BY PROJECT COMPONENT AND EXPENSE CATEGORY a/
(Percent)

Expense Category	Project Component			Total
	Institutional & Manpower Development	Research	Field Operations	
Technical Assistance	25	4	8	37
Training	9	2	2	13
Commodities	3	1	3	7
Other Costs	2	1	32	35
Evaluation	NA	NA	NA	1
Contingency	NA	NA	NA	7
Component Sub-Total	39	8	45	NA
				100

a/ This table does not include a $5.0 million loan under the Agricultural Commodities and Equipment Program (391-0468)

NA= Not Applicable.

is to be sustained beyond the end of the project in 1991. The principal elements of recurrent costs are as follows:

a. seedling production;

b. tree planting and management;

c. soil conservation activities; and,

d. Forest Department staff and related administrative expenses.

The project has been designed to ensure that mechanisms will be developed to meet these recurrent costs during the course of the project.

TABLE 33
DISTRIBUTION OF GOP FUNDS BY PROJECT COMPONENT AND EXPENSE CATEGORY
(Percent)

Expense Category	Project Component			Total
	Institutional & Manpower Development	Research	Field Operations	
Training	3	1	-	4
Commodities	-	-	1	1
Other Costs	4	10	74	88
Contingency	NA	NA	NA	7
Component Sub-Total	7	11	75	NA
				100

NA = Not Applicable.

The project stresses the development of privately owned nurseries for the production of tree seedlings to be sold to interested farmers. These nurseries will be supported by an initial guaranteed seedling market and technical assistance provided by the Forest Departments. Limited backup capacity in government nurseries will also exist. The economic analysis indicates that even with very conservative assumptions, farm forestry activity is feasible and attractive. Thus it is expected that growth in adoption of farm forestry practices during the project will generate both on-farm nursery production capacity and a market for other privately grown seedlings.

The models of on-farm tree crop management have been explicitly designed for small subsistence-oriented farmers. These models emphasize the use of submarginal agricultural land adjacent to cultivated areas, the use of on-farm labor and a net savings of labor from the overall farm family perspective. Positive economic returns and increased agricultural potential are also incorporated. Successful demonstration should provide ample illustration of the feasibility of meeting farm forestry labor needs with on-farm labor.

In the case of the improvement and expansion of irrigated forest plantations in the Sind, recurrent costs incurred for tree planting and management are expected to be met through the use of the Sind Forest Department's self-financing mechanism. This mechanism allows the reinvestment of government forestry revenues

for forest management on government plantations. The positive return demonstrated in the economic analysis supports the assumption that activities initiated in the Sind can be self-sustaining.

The GOP has demonstrated commitment to soil conservation activities as evidenced by over fifteen years of afforestation work in the Mangla and Tarbela watersheds. There is every indication that this commitment will be sustained. GOP interest in the preservation of hydroelectric and water storage capacity and its objective of increasing agricultural productivity all support this assumption.

The Provincial Forest Departments of the Punjab, NWFP and Baluchistan and the Office of the Inspector General of Forests will be adding staff for the project. The costs generated by these staff and related administrative and general operating expenses constitute most of the GOP financial contribution to the project. The GOP will bear all staff and related costs from the outset. To support this commitment and other financial requirements, the GOP has designated farm and energy forestry as a significant new development activity in its Sixth Five-Year Plan which commences on July 1, 1983. Rs 612 million ($47.7 million equivalent) have been earmarked for this initiative largely in response to the A.I.D. project, and the 1980 Pakistan Cabinet Policy statement on the importance of fuelwood to Pakistan's energy supplies. This provides sufficient evidence of the GOP's willingness to bear this portion of recurrent costs.

Finally, it must be noted that farm and energy forestry is a new activity in Pakistan and is the subject of much interest among the international donor agencies. Specifically, the World Bank and FAO are planning substantial programs in this sector to commence in 1987 and 1988. Both agencies have expressed a desire to build on the experience of the A.I.D. project and thus to expand the available foreign aid support in this sector.

4. Disbursement Mechanisms

All A.I.D. grant funds used to finance foreign exchange costs will be disbursed by A.I.D. to the supplier of the goods or services. Activities in this category consist of the prime technical assistance contract (which will be funded through the normal PIO/T-direct A.I.D. contract mechanism), offshore commodities (which will be procured by the prime contractor and included in his contract), and participant (overseas) training (which will be funded through PIO/Ps).

A.I.D. grant funds will be used to finance eight different categories of local costs as follows: (a) construction of field offices (each consisting of an estimated 1,000 sq. ft. of office and small warehouse space) in approximately 23 districts and tehsils in the NWFP, Baluchistan, and the Punjab in support of the field operational activities; (b) construction of private sector nurseries for about 50,000 seedlings on about 1/4 to 1/2 acre each, involving, e.g., land leveling work, digging field ditches, and building fences and sheds, in the NWFP, Baluchistan, and the Punjab; (c) soil conservation work on about 8,000 acres of land in the NWFP and primarily the Sind, involving, e.g., the construction of check dams, the unplugging of gullies, terracing of fields, and planting soil-holding species; (d) land levelling work on the Sind government plantations, consisting of rehabilitation of canal systems on about 2400 acres and construction of new watercourses on about 400 acres; (e) construction of a hostel for 24 students at PFI in Peshawar, NWFP; (f) tuition for students enrolled in B.Sc. and M.Sc. training programs at PFI; (g) locally procured research commodities, equipment and furniture for the field offices, and planting materials such as seeds and shovels; and, (h) the local costs associated with technical assistance.

The local costs associated with technical assistance will be disbursed in rupees directly by USAID/Pakistan. The Fixed Amount Reimbursement (FAR) method will most likely be employed to construct the field offices. The hostel at the PFI will most likely involve a direct A.I.D. contract for A&E services and a host country construction contract. The remaining categories of local costs will be disbursed directly by the O/IGF and the relevant Provincial Forest Departments who will periodically submit requests to A.I.D. for reimbursement along with a detailed itemization of expenses incurred. A Project Implementation Letter (PIL), which details the procedure to be followed and the fiscal reporting requirements, will be issued shortly after the Project Agreement is signed.

F. Environmental Analysis

This project has two major purposes. The primary purpose is to strengthen the capability of institutions at the federal, provincial, and local levels to design, implement, and evaluate policies and programs for increasing the production of fuelwood and timber in Pakistan. The secondary purpose of the project is to demonstrate the economic, technical, and social feasibility of producing tree crops on privately-owned farm and range lands. This project will have beneficial impacts on both the natural and the human environments. It will stabilize soils and improve their productivity, reduce erosion and subsequent siltation of waterways, increase the production of products and crops needed to sustain and enhance rural economies, and reduce the necessity for applying chemical fertilizers and soil conditioners to farmlands. Because of these benefits and the absence of adverse environmental effects, the Mission recommended, at the time of PID submission, a negative determination in the Initial Environmental Examination (IEE), with which AID/Washington agreed.

The APAC approval cable (See Annex A) stated that the project would have "potential for enhancing the quality of the environment." To help document these benefits, the APAC recommended that an environmental profile be developed for project areas. This process has begun. The information obtained is included in detail in technical reports by project design team consultants which are on file with USAID/Pakistan and ASIA/TR/EFE, and is summarized in the Technical Analysis Section of this project paper. These environmental analyses will be supplemented further during project implementation under the ecological research component. The primary purposes of this research will be: (1) to develop guidelines for assessing site factors and characterizing site types that will enable farm foresters to prescribe workable approaches to on-farm tree crop management; and, (2) to design and evaluate soil conservation measures for alternative site conditions in the barani region.

The overall project design remains largely the same as that described in the PID. Significant changes include: (1) a change in the life of project from FY 1984 - FY 1990 to FY 1983 - FY 1991; (2) a change in funding from a $25 million ESF Grant and an $18.5 million GOP contribution to a $25 million ESF Grant, a $5.0 million loan under the Agricultural Commodities and Equipment Program (391-0468), and a $14.3 million GOP contribution; and, (3) a reduction in the number of acres to be treated in the field operational components of the project. However, all of these changes are minor within the overall context of the project and the long-term environmental benefits that it is expected to generate. The

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environmental consequences will not vary in type or in magnitude from those described in the IEE contained in the PID. Therefore, it is recommended that the negative finding of the IEE should stand. A copy of the approved IEE is included as Annex M.

G. Narcotics Impact Statement

As mentioned in Section I. of this project paper, as far as is known, poppies are not grown in the seven districts in the NWFP, Punjab, and Baluchistan which have been selected as sites for field operational activities on privately-owned lands under this project. Nevertheless, to assure that this continues to be the case and to further the U.S. Government's continued efforts, in conjunction with the GOP, to curtail opium poppy cultivation and the processing of opium into heroin in Pakistan, the following poppy clause will be included in the Project Agreement:

> "The Government of Pakistan (GOP) agrees to undertake appropriate measures to prohibit cultivation of opium poppy and/or processing of opium into heroin or morphine base within any area benefiting from this Project. In the event that a determination is made that the cultivation of opium poppy and/or processing of opium into heroin is occurring in an area programmed to benefit or benefiting from this Project, no assistance under this Project directly benefiting that area shall commence, and, if commenced, such assistance shall be suspended until the prohibited activity is eliminated. This suspension of assistance may, at the option of the United States Government, and in accordance with applicable law, include removal of any services or facilities in the area until the prohibited activity is fully eliminated. If the prohibited activity found to exist is not fully eliminated within a specified period of time to be agreed upon by the United States Government and the GOP, all assistance under this Project directly benefiting that area may be terminated.
>
> If, prior to the Project Assistance Completion Date (PACD) established by A.I.D. for this Project as it may be from time to time amended, it is determined that the prohibited activity is occurring in an area which has benefited from this Project and the prohibited activity is not eliminated within a period of time to be agreed upon by the United States Government and the GOP, the GOP shall reimburse A.I.D. for all assistance that the GOP has received from A.I.D. under this Project, which has resulted in direct benefits to that area in which the prohibited activity is occurring. Such reimbursement shall be treated as a refund under the relevant provisions of the Project Agreement."

In addition, the FP&D project will indirectly support activities under the Gadoon-Amazai Area Development (GAAD) Project (391-0485), the goal of which is to contribute to the eradication of opium poppy production within a process of rapid socio-economic development in the remote areas of Pakistan. The GAAD project, which is the major vehicle by which A.I.D. will support the USG and GOP's efforts to eliminate opium poppy cultivation in Pakistan, will focus on an area in the NWFP which produces about 50 percent of the opium poppies grown in Pakistan. The GAAD project includes a major watershed management and reforestation program to be implemented by the NWFP Forest Department. The involvement of the NWFP Forest Department staff in the institutional strengthening, training, outreach, and research activities under the FP&D project will increase their capability and capacity to effectively implement reforestation activities under the GAAD project.

VI. CONDITIONS, COVENANTS, AND NEGOTIATING STATUS

A. Conditions Precedent to Disbursement

1. Conditions Precedent to Initial Disbursement

Except as A.I.D. may otherwise agree in writing, prior to any disbursement under this project or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D., within sixty (60) days after the signing of the Project Agreement:

a. a written opinion of Counsel acceptable to A.I.D. that the Project Agreement has been duly authorized and/or ratified by, and executed on behalf of the Grantee and that it constitutes a valid and legally binding obligation of the Grantee in accordance with all of its terms; and,

b. a written statement setting forth the names and titles of persons holding or acting in the Office of the Grantee and representing that the named person or persons have the authority to act as the representative or representatives of the Grantee, together with a specimen signature of each such person certified as to its authenticity.

2. Conditions Precedent to Initial Disbursement for Farm and Energy Forestry Field Operations

Except as A.I.D. may otherwise agree in writing, prior to the disbursement of funds for activities under the Farm and Energy Forestry Field Operations component of this project other than for technical assistance, vehicles, household/office furniture. and other equipment for said technicians, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee, acting through its Ministry of Food, Agriculture and Cooperatives, shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D., evidence that:

a. an administrative unit has been authorized and established within the Ministry of Food, Agriculture and Cooperatives to manage all project component activities; the authorities, duties and responsibilities of the overall manager for the administrative unit have been adequately defined; an adequately trained and experienced overall manager of the administrative unit has been appointed; and sufficient support staff have been appointed to enable the manager to carry out his duties effectively;

b. a unit within the Pakistan Forest Institute has been authorized, established, and adequately staffed to assume responsibility for designing and implementing professional curricula for farm and energy forestry;

c. a management system has been developed to identify, select, approve, implement, monitor and certify completion of Farm and Energy Forestry Field activities; and,

d. the mechanisms by which A.I.D. will fund Farm and Energy Forestry Field activities have been jointly agreed to.

3. Conditions Precedent to Initial Disbursement for Activities under the Farm and Energy Forestry Field Operations Component in a Specific Province

Except as A.I.D. may otherwise agree in writing, prior to any disbursement for activities in a specific province pursuant to the Farm and Energy Forestry Field Operations component of this project, other than for technical assistance, vehicles, household/office furniture, and other equipment for said technicians, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee, acting through its Ministry of Food, Agriculture and Cooperatives, shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D., evidence that:

a. an administrative unit has been authorized and established within the Forest Department for that province for which the disbursement is sought to manage all project component activities within the Province; the authorities, duties and responsibilities of the overall manager for that administrative unit have been adequately defined; an adequately trained and experienced overall manager has been appointed for that unit; and sufficient support staff have been appointed to enable the manager to carry out his duties effectively; and,

b. a plan of training, acceptable to A.I.D. including a schedule of training adequate to provide the staff skills needed for the project, has been authorized and approved by the Provincial Government for that province for which the disbursement is sought and individuals have been identified for each training slot for the 12 months following the date of authorization and approval of said plan and schedule.

B. Covenants

1. The Grantee shall assure that a Federal Advisory Committee for Farm and Energy Forestry is established, holds regularly scheduled meetings, and serves as a review and advisory body for overall implementation of the project. This Committee shall include, at a minimum, representatives of the Ministries of Food, Agriculture, and Cooperatives, Planning and Development, and Petroleum and Natural Resources and of each of the Provinces.

2. The Grantee shall, in furtherance of adequate monitoring and evaluation:

a. carry out a scheduled monitoring program acceptable to A.I.D. which shall include periodic site visits to ensure the proper implementation of various project elements;

b. provide A.I.D. with copies of all internal monitoring information and written reports of all review activities; and,

c. provide for the designated Federal and Provincial project directors, the A.I.D. Project Officer, the Technical Assistance Team Leader, and others as appropriate, to hold periodic review meetings for the purpose of evaluating project progress and requirements.

3. The Grantee shall participate in periodic external project evaluations by assigning senior representatives of participating ministries and agencies to joint A.I.D. - Grantee Evaluation Teams.

4. The Grantee; acting through its Federal Ministry of Food, Agriculture and Cooperatives, and each of the participating provinces in the Project, shall make every reasonable effort to require that each person trained under this project works in activities related to farm and energy forestry in Pakistan for not less than three times the length of time of his or her training program provided, however, that in no event shall the individual be allowed to work in farm and energy forestry activities for less than one year nor be required to work in farm and energy forestry activities for more than five years from the date of the individual's completion of training.

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5. The Grantee shall examine strategies to limit grazing on afforested lands to ensure adequate tree crop management on private farm land and encourage reafforestation after the harvest. The Grantee shall provide written reports to A.I.D. describing progress in these areas every 24 months from the date of the signing of this Agreement.

6. The Grantee shall ensure adequate maintenance for all heavy equipment, vehicles, and durable commodities and provide a periodic training program for equipment operators and maintenance personnel. The Grantee shall provide written reports to A.I.D. describing its actions in these areas every 24 months from the date of the signing of this Agreement.

C. Negotiating Status

The above Conditions Precedent and Covenants have been discussed with and agreed to by the Government of Pakistan. During Project Agreement negotiations, USAID/Pakistan will incorporate into the Agreement appropriate language to cover these terms and conditions.

PROJECT PAPER

PAKISTAN - FORESTRY PLANNING AND DEVELOPMENT

391-0481

VII. A N N E X E S

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FM SECSTATE WASHDC
TO AMEMBASSY ISLAMABAD PRIORITY 4306
BT
UNCLAS STATE 005355

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: PAKISTAN FORESTRY PLANNING AND DEVELOPMENT (391-0481)

1. APAC REVIEWED AND APPROVED SUBJECT PID ON DECEMBER 20. MISSION WAS COMMENDED ON DOCUMENT AND ABLE PRESENTATION. FOLLOWING ISSUES SHOULD BE ADDRESSED DURING DESIGN OF PROJECT.

2. BENEFICIARIES: APAC WAS CONCERNED THAT PRIMARY BENEFICIARIES OF PROJECT WOULD BE LARGE LANDOWNERS AND COMMERCIAL CONSUMERS. IN DESIGNING PROJECT, MISSION SHOULD STRIVE TO MAXIMIZE BENEFITS TO THE RURAL POOR. APAC SUGGESTS DESIGN TEAM EXAMINE CAREFULLY HOW AND TO WHAT EXTENT PROJECT ACTIVITIES WILL AFFECT LANDLESS LABORERS, TENANT FARMERS, LANDOWNERS, AND CONSUMERS. PROJECT PAPER SHOULD INCLUDE BENEFICIARY PROFILE, CONFIRMATION THAT PROJECT ACTIVITIES WILL BE GENERALLY CONFINED TO LESS PROSPEROUS DISTRICTS, AND AN ANALYSIS OF THE PERCENTAGE OF DEMAND FOR TYPES OF TIMBER USED FOR HOME CONSUMPTION AS OPPOSED TO VARIETIES USED FOR COMMERCIAL CONSUMPTION. PP PURPOSE/GOAL STATEMENT SHOULD REFLECT THE INTENT OF THE PROJECT TO ESTABLISH A SUSTAINABLE FUELWOOD SUPPLY WHICH IS PRODUCED BY AND WHICH BENEFITS THE RURAL POOR. IN THIS CONTEXT THE PP SHOULD REFLECT MECHANISMS TO ASSIST FARMERS AND FARM WORKERS IN ORGANIZING, MANAGING, AND IMPLEMENTING PROJECT ACTIVITIES.

3. SITE SPECIFIC ANALYSIS: THE PROJECT PAPER SHOULD PROVIDE SITE SPECIFIC ANALYSIS OF SEVERAL LOCATIONS IN EACH OF THE THREE PROJECT PROVINCES. THESE SITE ASSESSMENTS SHOULD INCLUDE SOCIO-ECONOMIC SURVEYS, ORGANIZATION AND MANAGEMENT PROFILES, FUELWOOD SUPPLY/DEMAND MARKETING ASSESSMENTS, AND TREE CROP PRODUCTIVITY POTENTIAL ASSESSMENTS. THE SITE SPECIFIC ANALYSIS SHOULD LIST THE CONSTRAINTS AND OPPORTUNITIES ASSOCIATED WITH EACH DEVELOPMENT AND THE CRITERIA FOR PROSPECTIVE SITE SELECTION.

4. EXPANSION OF BUREAUCRACY: PAGE 11 OF THE PID INDICATES THAT THE ESTABLISHMENT OF NEW QTE WINGS UNQTE RESPONSIBLE FOR ON-FARM TREE CROP ACTIVITIES WILL REQUIRE TRAINING A NEW GENERATION OF PROFESSIONALS AND TECHNICIANS.

BEFORE EMBARKING ON AN EXPANSION OF THE PROVINCIAL FOREST DEPARTMENTS, THE MISSION AND THE GOP SHOULD EXAMINE CAREFULLY THE DEGREE TO WHICH EXISTING FORESTRY OFFICIALS CAN ABSORB THE ADDED RESPONSIBILITIES. THE PROJECT SHOULD BE DESIGNED SO AS TO MINIMIZE THE REQUIRED NUMBER OF ADDITIONAL GOVERNMENT EMPLOYEES. THE PROJECT DESIGN TEAM SHOULD IDENTIFY LOCAL NON-GOVERNMENTAL ORGANIZATIONS AND INSTITUTIONS COMPETENT IN FARM MANAGEMENT WHICH COULD PROVIDE ADDITIONAL TRAINING, MANAGEMENT, AND IMPLEMENTATION CAPABILITIES FOR THE PROJECT.

5. RELATIONSHIP WITH AGRICULTURE: THE APAC SUPPORTED THE MISSION'S INTENTION TO FUND AGRO-FORESTRY RESEARCH BUT NOTED ESSENTIAL LINKS WITH ONGOING FARMING SYSTEMS RESEARCH ACTIVITIES BOTH IN-COUNTRY AND WORLDWIDE. ACCORDINGLY, THE APAC SUGGESTS THAT FORMAL MECHANISMS BE DEVELOPED TO IMPROVE COOPERATION BETWEEN FORESTRY AND AGRICULTURE AT THE CENTRAL AND PROVINCIAL LEVELS, PARTICULARLY OF EXTENSION SERVICES, I.E., JOINT TRAINING, ETC.

6. PROJECT ANALYSES:

A. SOCIAL SOUNDNESS ANALYSIS: APAC BELIEVES THAT A PARTICULARLY STRONG SOCIAL SOUNDNESS ANALYSIS IS REQUIRED TO ADDRESS-BENEFICIARY ISSUE DISCUSSED IN PARA 2 AND TO IDENTIFY INCENTIVES WHICH WILL STIMULATE LOCAL PARTICIPATION. SPECIFICALLY, ALTERNATIVE CREDIT SYSTEMS FOR SMALL FARMERS SHOULD RECEIVE IN DEPTH CONSIDERATION DURING THE PROJECT PAPER DESIGN. MISSION MAY WISH TO CONDUCT A SAMPLE ATTITUDINAL SURVEY IN POTENTIAL PROJECT AREAS TO DETERMINE WHAT TARGET BENEFICIARIES PERCEIVE THEIR OPPORTUNITIES TO BE FOR PRODUCING AND MARKETING TREE

CROPS. ANALYSIS SHOULD ALSO ASSESS NUTRITIONAL CONSEQUENCES OF TAKING LAND (HOWEVER MARGINAL) OUT OF FOOD CROPS TO PLANT TREES.

B. FINANCIAL ANALYSIS: PROJECT FINANCIAL ANALYSIS SHOULD DISCUSS THE GOVERNMENT'S ABILITY TO FINANCERECURRENT COSTS AND THE EXTENT TO WHICH:LIMITED GOVERNMENT - RESOURCES WILL BE A CONSTRAINT TO THE CONTINUANCE OF AN IMPROVED FORESTRY PROGRAM ONCE THE PROJECTTERMINATES. IS THERE ANY POSSIBILITY THAT THE GOVERNMENT CAN RECOVER ITS EXPENDITURES IN THE SECTOR BY TAXING THE PRODUCERS-OR CHARGING FOR ITS SERVICES?

C. ENVIRONMENTAL ANALYSIS: THE APAC NOTED THE POTENTIAL FOR ENHANCING THE QUALITY OF THE ENVIRONMENT THROUGH SOUND MANAGEMENT OF TREE CROPS AND RECOMMENDS THAT AN ENVIRONMENTAL PROFILE BE DEVELOPED FOR PROJECT AREAS. AN ENVIRONMENTAL PROFILE WOULD BE USEFUL IN-SELECTING SITES FOR NURSERIES AND DEMONSTRATION PLOTS AND-WOULD

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ENABLE THE MISSION AND THE GOP TO CONCENTRATE PROJECT RESOURCES IN AREAS WITH THE GREATEST POTENTIAL FOR AMELIORATING ENVIRONMENTAL DEGRADATION PROBLEMS. THE PROFILE WOULD ALSO PROVIDE A BASELINE FOR ENVIRONMENTL MONITORING ACTIVITIES. ASIA/TR/EFE WILL PROVIDE BY SEPTEL SUGGESTIONS FOR INCORPORATING THESE POINTS IN PROJECT DESIGN AND IMPLEMENTATION.

D. ECONOMIC ANALYSIS: PP SHOULD OUTLINE HOW TIMBER MOVES FROM PRODUCER TO CONSUMER, WHO CONTROLS THE HARVESTING, TRANSPORT AND MARKETING MECHANISM AND DISCUSS IMPACT PROJECT WILL HAVE ON CURRENT AND FUTURE TIMBER MARKETS.

7. WOMEN: APAC REQUESTS THAT MISSION ADDRESS ROLE OF WOMEN IN PROJECT ACTIVITIES. THIS MAY BE DONE IN THE PP OR IN A SIDE LETTER, IF THE MISSION FEELS THE LATTER MORE EFFECTIVE. SOCIAL SOUNDNESS ANALYSIS SHOULD DETERMINE WHETHER PROJECT ACTIVITIES WILL INCREASE OPPORTUNITIES FOR WOMEN OR ADD TO THEIR BURDENS.

8. EVALUATION: PID REFERS TO PAST USAID EFFORTS IN FORESTRY. PP SHOULD EXAMINE LESSONS LEARNED FROM THESE PAST ACTIVITIES AND FROM RELEVANT FORESTRY ACTIVITIES IN OTHER COUNTRIES. APAC WILL EXPECT PROJECT TO HAVE STRONG ON-GOING MONITORING AND EVALUATION PLAN.

9. MANAGEMENT OF PROJECT: PP SHOULD DISCUSS HOW MISSION ENERGY AND AGRICULTURAL OFFICES WILL COOPERATE TO IMPLEMENT PROJECT, THE EXTENT TO WHICH LONG-TERM TECHNICAL ASSISTANCE WILL BE REQUIRED TO MANAGE THE PROJECT, AND

HOW THE MISSION INTENDS TO PROCURE ANY LONG-TERM TECHNICAL ASSISTANCE REQUIRED. PP SHOULD CONSIDER WHAT GOP MECHANISMS CURRENTLY EXIST IN THE AGRICULTURAL, FORESTRY, AND BIOMASS ENERGY SECTORS OF THE FEDERAL AND PROVINCIAL LEVELS WHICH COULD SUPPORT PROJECT MANAGEMENT AND COORDINATION.

10. NARCOTICS: GIVEN THAT A LARGE NUMBER OF PROJECT ACTIVITIES WILL TAKE PLACE IN THE NWFP, DESIGN TEAM SHOULD EXPLORE STRATEGIES TO SUPPORT THE MISSION'S EFFORTS TO REDUCE POPPY CULTIVATION. SHULTZ
BT
#5355

5C(2) PROJECT CHECKLIST

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

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 1982 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;

   (a) Congressional Notification.

   (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that amount)?

   (b) Yes, assistance is within the 1983 operational year budget.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,00, will there be

(a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	(a) Yes. (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?	No further legislative action is required.
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.)	Yes, project meets the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources.
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?	Yes, Mission Director's 611 (e) certification is included in the Project Paper.

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

6. No. Complementary projects by the World Food Program, World Bank, UNHCR, ADB, Germany, Switzerland, and FAO already have been approved or are in the design stage. However, no project specifically addresses the importance of wood in Pakistan's energy sector; no project provides the technical assistance and training necessary to assist Pakistan in developing a comprehensive wood resource policy and plan; and, no project provides the training and technical assistance essential for the development of forestry on private lands. The A.I.D. project provides assistance to fill these gaps. It will be monitored by World Bank and FAO who may provide complementary assistance in these areas later in the decade.

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; and (c) encourage development and use of cooperatives, and 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.

7. (a) Yes. Project will reduce time and/or money spent by rural families on their domestic energy needs. This will allow them increased time to produce exportable goods and increase their disposable income available to purchase imported goods. Additionally, the planning component of the project will assist the GOP in identifying areas of comparative advantage in international wood products trade.

(b) Yes. Project will encourage the production of wood on private lands. Project will encourage the establishment of privately-owned nurseries to meet farmers' needs for seedlings.

(c) No

(d) Yes. The project will increase knowledge and awareness of wood marketing systems and could thus increase free competition in these areas.

(e) Yes. The project will increase the efficiency of agricultural production by developing, demonstrating, and encouraging the use of on-farm tree crop management systems to enhance agricultural productivity. A major increase in agricultural productivity could occur simply as a result of substituting fuelwood for cow dung, thus making the latter available for use as fertilizer.

(f) No

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

8. U.S. private enterprise will participate as suppliers of commodities, technical assistance, and training under the project.

9.	FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. 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.	This project is financed by ESF funds. Nevertheless, the GOP will contribute the equivalent of $14.3 million over the life of the project to help finance the local costs of the project. The Mission Director has certified the disbursement of U.S. dollars in lieu of U.S. Treasury-owned excess rupees to cover some of the local costs under this project. This action is consistent with one of the major objectives of the renewed economic assistance program to Pakistan which is to maximize the balance of payments impact of the program.
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?	Yes. The U.S.-owned excess Pakistani rupees known as Mondale rupees have been fully programmed in support of other projects.
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. 521. 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?	N.A.
13.	FAA 118(c) and (d). Does the project comply with the environmental procedures set fo th in AID Regulation 16? Does	Yes. Copy of the Initial Environmental Examination with a "negative finding" is included in the Project Paper.

the project or program take into consideration the problem of the destruction of tropical forests?	Yes. This project should impact on the problem of forest destruction by providing rural inhabitants with increased supplies of fuelwood and improved abilities to manage their own woodlots.
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)?	N.A.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria	This is an ESF-funded project.
a. FAA Sec. 102(b), 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	N.A.

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?	N.A.
b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?	N.A.
c. FAA S . 107. Is 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)?	N.A.
d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activitiy with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?	N.A.

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.	N.A.
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?	N.A.
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	N.A.

institutional development; and supports civil education and training in skills required for effective participation in governmental processes esential to self-government.

2. Development Assistance Project Criteria (Loans Only) — This is an ESF-funded project

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

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? — N.A.

c. ISDCA of 1981, Sec. 724 (c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)? — N.A.

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic or political

Yes. This program will increase the productivity of the rural poor, thus effecting a more equitable income distribution conducive to political and economic stability.

The program focuses on helping the majority in rural areas by expanding

stability? To the extent possible, does it reflect the policy directions of FAA Section 102?	productive investment and services in rural areas, and, to the maximum extent possible, will involve the Pakistani private sector, both as a participant and beneficiary of this project, thereby reflecting the policy directions of FAA Section 102.
b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?	No
c. FAA Sec. 534. Will E F 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?	No
d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country have Special Account (counterpart) arrangements been made?	N.A.

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable : USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

Office of the Director

FORESTRY PLANNING AND DEVELOPMENT PROJECT, 391-0481

FAA SECTION 611 (e) CERTIFICATION

I, Donor M. Lion, principal officer of the Agency for International Development in the Islamic Republic of Pakistan, having taken into account, among other things, the maintenance and utilization of projects in the Islamic Republic of Pakistan previously financed or assisted by the United States, do hereby certify pursuant to Section 611 (e) of the Foreign Assistance Act of 1961, as amended, that in my judgement the Islamic Republic of Pakistan has both the financial capability and the human resources capability to effectively implement, utilize and maintain the proposed Forestry Planning and Development Project, 391-0481.

This judgement is based upon the project analysis as detailed in the Forestry Planning and Development Project Paper and is subject to the conditions imposed therein.

Donor M. Lion

Donor M. Lion
Director
USAID/Pakistan

July 14, 1983
Date

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UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable : USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

THE DIRECTOR

FORESTRY PLANNING AND DEVELOPMENT, 391-0481

FAA SECTION 612 (b) CERTIFICATION

A major purpose of the $ 1.625 billion economic assistance program negotiated between the Governments of the United States of America and Pakistan, acknowledged by both governments and a primary reason for both governments having decided to develop an economic assistance package, is to provide balance of payments assistance to Pakistan.

I have carefully reviewed the advisability of disbursing United States dollars in lieu of United States-owned excess foreign currency to pay for local costs of projects being implemented in Pakistan. In light of the United States Government's objectives concerning the program, I have determined that it would be prejudicial to U.S. interests and goals to pay for all local currency costs with United States-owned rupees. Such a procedure would prevent the U.S. from providing the maximum amount of balance of payments support under the economic assistance package, and would consequently undercut one of the basic objectives of the program. The objective of providing balance of payments assistance to Pakistan can best be achieved by disbursing United States dollars to pay for local costs of the program. Section 612(b) of the Foreign Assistance Act of 1961, as amended, authorizes the administrative official approving the voucher to determine that local costs will be funded with direct payment of dollars for the program. Pursuant to this provision, Handbook 19 requires that the Mission Director (or his designee) make a determination as to the reason in any instance where United States dollars are used (disbursed) when United States-owned foreign currency is available. Where dollars are used for local costs financing, USAID/Pakistan will, therefore, make disbursements to the Government of Pakistan in U.S. currency.

FAA Section 612(b) Certification (Continued)

In addition to disbursing United States dollars for local costs, USAID/Pakistan plans to use United States-owned excess rupees to finance some of the local costs associated with United States dollar-financed activities, thereby increasing the overall development impact of the proposed $1.625 billion economic assistance program.

In view of the above rationale, I, Donor M. Lion, principal officer of the Agency for International Development in Pakistan, pursuant to Section 612(b) of the Foreign Assistance Act of 1961, as amended, do hereby certify the need to disburse United States dollars to cover local currency costs in lieu of using United States-owned excess rupees under the Forestry Planning and Development Project.

Donor M. Lion

Donor M. Lion
Director
USAID/Pakistan

July 14, 1983

Date

بسم الله الرحمن الرحيم

GOP LETTER OF REQUEST FOR ASSISTANCE

No. D-17(US-I)/83.
Government of Pakistan
MINISTRY OF FINANCE AND
ECONOMIC AFFAIRS
(ECONOMIC AFFAIRS DIVISION)

Telegram : ECONOMIC
Telex : ECDIV No. 08-634

JOINT SECRETARY
Tele: 21520

Islamabad, the 11 July, *1983.*

Dear Mr. Lion,

As part of the agreement between our two governments on a six-year $1.625 billion economic assistance program, the Government of Pakistan formally requests from A.I.D. twenty-five million dollars (U.S. $25,000,000) in United States assistance to fund a Federal Forestry Planning and Development Project.

Funds provided by A.I.D. under the project will be used, amongst other things, to:

1. improve Pakistan's institutional capability for forestry policy, planning and management at the federal and provincial levels by providing assistance in management and training;
2. strengthen the capability of the federal forestry policy analysis team to develop policies and budgetary allocations and to coordinate and manage federal farm and energy forestry programs;
3. establish provincial forestry planning teams with financial analysis, economics, sociology, and technical skills necessary for project identification, design, feasibility assessment, implementation and evaluation;
4. develop a long-term program plan for the coordinated development of Pakistan's forest and fuelwood resources on public and private lands;
5. develop programs and demonstrate the economic, technical and social feasibility of producing tree crops, principally fuelwood, on privately-owned farm and range lands;

Cont'd...../2.

6. develop provincial forest department infrastructures necessary for the design and implementation of tree crop management programs on privately-owned i and range lands;

7. design and initiate the implementation of a farm and range land tree crop management research program including the development of technically feasible and socio-economically viable strategies for producing trees while enhancing agricultural productivity; and

8. strengthen applied forestry research efforts at the Pakistan Forest Institute, regional forest research stations, and selected universities.

I understand that, subject to the availability of funds to A.I.D. for this purpose, approximately five million dollars (U.S.$5,000,000) may also be provided from the Agricultural Commodities and Equipment Program to finance land levelling and workshop equipment, spare parts, and research and transport equipment for this program.

The Government of Pakistan assures the United States of its full cooperation in carrying out the Forestry Planning and Development Project. The personnel, financial and other inputs required of us will be provided with Federal support in an expeditious manner. Once the Project Agreement is signed, A.I.D. is hereby authorized to proceed with the implementation of the project in accordance with the terms and conditions as set forth in that Agreement.

We look forward to a continued effort by both our governments to implement a productive and beneficial program for the people of Pakistan.

Yours sincerely,

(SYED NISAR ALI SHAH)

Dr. Donor M. Lion
Director
USAID/Pakistan,
Islamabad.

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List of Project:
From FY 83 to FY 91
Total U.S.Funding $ 25 million
Date Prepared: June 21, 1983

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number: Forestry Planning and Development (391-0481)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: -To increase Pakistan's energy self-sufficiency. -To reverse the process of deforestation.	Measures of Goal Achievement: -Approximately 20,000 farm families achieve fuelwood self-sufficiency for domestic energy needs -The equivalent of 24,000 acres of farm woodlots established on the lands of poor farmers	Project Evaluations Data collected by F.D. Monitoring and Evaluation Units Forest and Fuelwood Development Plan and Related Studies Field inspections Records kept by Ministry of Food, Agriculture & Cooperatives Progress Reports	Assumptions for achieving goal targets: -Farm Forestry will gain support of farmers -GOP policies will continue to support farm and energy forestry activities
Project Purpose: -To enhance the capabilities of GOP institutions in designing and implementing plans and programs for increasing the production of fuelwood and timber in Pakistan. -To demonstrate the economic,technical and social feasibility of producing tree crops on privately-owned farm and range lands.	Conditions that will indicate purpose has been achieved: End of project status. -Forest planning activities are fully staffed at both federal and provincial levels and progress is being made in relating forest development to overall development needs of Pakistan. -Private nurseries established, operating profitably, and supplying seedlings in quantity, quality, and timing required -Approximately 20,000 farm families establish the equivalent of about 24,000 acres of farm woodlot	Project Evaluations Data collected by F.D. Monitoring and Evaluation Units Forest and Fuelwood Development Plan and Related Studies Field inspections Records kept by Ministry of Food, Agriculture and Cooperatives Progress Reports	Assumptions for achieving purpose: -Land in private sector is available for afforestation -GOP policies will continue to support farm & energy forestry -GOP will utilize forest plan & related studies -Motivated & qualified indigenous personnel can be recruited & trained in sufficient numbers -Farmers believe fuelwood,fodder, timber will accrue to them

	-Number of farmers adopting on-farm tree crop management is increasing -Farm & Energy Forestry Unit is fully staffed and operational at all levels -Demand for seedlings for private lands is rising		-Farmers consider farm forestry profitable -Govt. will not tax farm forestry -Increased fuelwood availability does not lead to greatly increased consumption.
Outputs:	Magnitude of Outputs:		Assumptions for achieving outputs
Component 1: Institutional Capability and Manpower Development			
-A permanent GOP Forest and Fuelwood Planning Group within the Ministry of Food, Agriculture and Cooperatives Office of Inspector General of Forests (O/IGF)	-An operational planning group exists staffed by 3-6 persons	Project Evaluations Data collected by F.D. Monitoring and Evaluation Units Forest and Fuelwood Development Plan and Related Studies Field inspections Records kept by Ministry of Food, Agriculture and Cooperatives Progress Reports	-Qualified participants are selected for training -Technical consultants are effective in working with their counterparts -Training programs will effectively transfer skills and technology -Adequate personnel and budget support will be provided by GOP -Farm families are willing to use their labor to plant seedlings on their lands -Severe climate conditions (drought, etc) do not occur
-A permanent Forest and Fuelwood Planning Group in each of the four provinces	-Four operational planning groups exist comprised of 2-4 persons each		
-A series of studies on the role of timber and fuelwood in Pakistan's development	-Five or more studies completed on the role of wood in Pakistan's development		
-A permanent monitoring and evaluation group in the O/IGF and each of the Provincial Forest Departments	-Five operational M+E groups exist comprised of 1-3 persons each		
-A permanent Farm and Energy Forestry Unit within the O/IGF and in each of 3 provinces	-Farm and energy forest units established in O/IGF and in Punjab, NWFP, Baluchistan		
-Establishment of a professional curriculum in farm and energy forestry studies	-Curricula established at the BSc and MSc level at PFI and training 10-14 students/year		
-Establishment of a career corps in forest research	-Five full time researchers trained and working full time at PFI and various provincial locations		
Component 2: Research Program in Support of Farm and Energy Forestry			
-A completed assessment of alternative farm and energy forestry systems	-A series of field research experiments and analyses that identify most promising strategies for on-farm tree crop management to contribute to the farm enterprise.		

-A completed assessment of fuelwood demand, supply, and marketing systems Component 3 -Establishment of farm woodlots -Improvement of Sind Forest Plantations -Conversion of Sind Forest Plantations -Extension of Sind Forest Plantations -Production of Fuelwood -Production of Timber -Production of Fodder	-A series of studies for rural, village, and urban settings in various regions of Pakistan. The equivalent of 24,000 acres About 1800 acres About 550 acres About 400 acres About 52.5 million cubic feet About 3.8 million cubic feet About 2.4 million U.S. $ worth		
Inputs	Implementation Target (Type and Quantity)		Assumptions for providing inputs:
Financial	84 85 86 87 88 89 90 91 Total 2.2 2.1 2.3 3.0 3.5 3.0 3.8 [illegible].2 25 (U.S. Fiscal year million U.S. $)	USAID Progress and Evaluation Reports	-Highly motivated persons with technical skills can be recruited when needed -Qualified candidates can be placed in appropriate training programs
Technical Assistance Long-Term Short-Term Joint Career Corps	84 person months 83 person months (includes 8 for evaluation) 72 person months		
Professional Training Long-Term Short-Term Farmer Training	672 person months 224 person months 1,917 person months		

Site-Specific Description of Farm and Energy Forestry Field Operational Activities

1. Background

The population of Pakistan is 83.7 million (72% rural) and is increasing at 3% per annum. [illegible] of these people live in the plains and lower foothills area [illegible] the project area is located and where most of the country's food [illegible] produced. Much of this area is arid or semiarid, with sub-humid conditions along the northern fringes. Much of the drier zone is greatly modified by irrigation which tends to exacerbate natural problems of soil salinity and waterlogging. The natural forests in these regions have largely been cleared. What remains is subject to relentless browsing by goats and cattle, a major cause of erosion and gullying.

Wood meets 50-75% of cooking fuel needs. It is augmented on a wide scale by dung. Some 75% of Pakistan's fuelwood originates on private farm and range lands. There is thus a need for a major increase in fuel wood production. Many farmers throughout the project area already grow some trees although generally not in a systematic, effective manner.

There is important potential for expansion of farm tree crop management programs aimed at the production of fuelwood to increase farm income in other important ways by enhancing agricultural production through: (a) the provision of shelter against wind and desication for conventional crops; (b) increased fertility by way of nitrogen fixation; (c) greater fodder production; (d) playing a part in improving production from waterlogged and saline lands; (e) releasing dung for use as manure. Greatly increased local production is needed of wood for the construction and manufacturing industries to reduce the current $65 million worth of wood and wood derived imports and to increase exports of such products. Opportunities also exist to improve fuelwood and timber production from government irrigated plantations in Sind.

2. Farm Tree Crop Management Demonstrations in the NWFP and Punjab Barani

a. The Project Area

i. Location

Tree crop management programs will be developed in the following Districts and Tehsils:

BEST AVAILABLE

TABLE F-1: Project Areas

Province	District	Tehsils
NWFP	Kohat	Kohat Hangu
	Karak	Karak
Punjab	Rawalpindi	Rawalpindi Gujar Khan Kahuta
	Attock	Attock Pindi-Gheb Fatehjang Talagang
	Jhelum	Jhelum Chakwal
	Gujrat	Gujrat Kharian

ii. Climate

The climate in the area varies from sub-humid (rainfall above 20 inches to about 30 inches), through mainly semi-arid (12-20 inches mean annual rainfall) to dry semi-arid (8-12 inches).

The areas in the sub-humid range are in the north and northeast of the districts named in Punjab. Precipitation falls off to the south and west. Rainfall is erratic and occurs in two seasons: December-March and July-August.

Mean annual rainfall for the 4 Punjab districts may be summarized as follows:

Rawalpindi	from about 25 inches upwards
Attock	13-22 inches
Jhelum	18-28 inches
Gujrat	15 inches and upwards

The hottest months are June and July when temperatures exceed 100°F. Freezing temperatures can occur anywhere in the area during the winter and early spring; species such as A. arabica are sometimes damaged by frost.

iii. Landforms and Soils

Detailed accounts are given in the reconnaissance soil survey reports of the Soil Survey Department. The dominant landforms are the River Plains with terraced older and younger alluvial soils; Loess Plains which dominate much of the central part of the area, comprising

both massive, virtually structureless soils and some which are often calcareous, of well-defined structure. Residual soils cover large areas, e.g. across the south of the area as in eastern Kohat. They are characterized by weathered rock and often form ridge and trough uplands with characteristic, vertically-oriented, partly-weathered strata giving rise to sandy, loamy or clayey soils depending on the nature of the parent material. They are often gravelly or stony. In the Salt Range and elsewhere, the soils sometimes include massive saline deposits. Stony or gravelly soils of the Piedmont plain are prominent in the vicinities of the mountains and hill ranges. Soils in these areas tend to be weakly-structured and well-drained.

As a result of continuing natural erosion processes as well as severe browsing and grazing, much of the area is deeply gullied or covered with shallow, often skeletal soil. The gullying process - dramatic in the gently to moderately steeply rolling loess plains - is widely active as a result of unrelenting grazing and cultivation.

A small proportion of the area is classified by the Soil Survey Department as having moderate economic potential under dry farming. More of it is described as having moderate economic potential for dry farming and land with low potential for grazing. The bulk is classifed as having low potential for dry farming to low potential for grazing or woodland.

iv. Vegetation

The natural vegetation has for the most part been greatly modified or removed by clearing arable land or by grazing over a long period. Low-stature, open woodland survives on steep, naturally protected slopes. Dry Sub-Tropical broadleaved, moderately closed to scattered, woodland comprising branchy trees occurs on the slopes and in less accessible ravines.

In farming areas the landscape is sometimes dominated by widely spaced lines of single trees of *A. arabica* or *Zizyphus jujuba* growing along field berms.

The area of Punjab is 51 million acres, of which 25.7 million acres are cultivated in the irrigated areas and 2.4 million acres in the Barani. Land types in the Districts proposed for the selection of demonstration areas under the project are classified as follows:

TABLE F-2: Classification of Lands in Punjab Project Area (000's acres)

District	Irrigated farm areas	Barani farm areas	Range lands	Gully lands	Forest lands	Degraded lands	Total 000 acres
Rawalpindi	-	1,330	299	62	217	124	2,032
Attock	18	1,570	-	-	225	929	2,742
Jhelum	40	559	-	-	226	126	951
Gujrat	627	469	38	24	18	384	1,560
Total:	685	3,928	337	86	686	1,563	7,285

v. Opportunities for Tree Planting

On many farms, there are foothill areas or abandoned, sometimes-terraced, old fields that are used only for the meagre amounts of grazing and browse that they provide; they continue to deteriorate. These areas could carry plantations including plantations producing tree fodder. Many farms include unstable gullies and ravine areas where tree planting conditions vary from harsh to potentially good. Check dams and other engineering devices combined with control of stock by tethering or stall feeding, would quickly create fair to excellent tree planting sites and conditions in all these areas. In addition, there are virtually unlimited opportunities for planting single trees or single rows of trees along the margins of fields or, where contour ridging and terracing are done, along field berms. There are also opportunities for the planting of individual trees or lines of them along farm tracks and near homesteads.

b. Development Strategies

i. Needs to be Met

Farm tree crop management will be encouraged in order to produce:

(1) fuelwood to meet the owner's needs, to substitute for the dung that he currently uses and, if there is a surplus, for sale to produce cash;

(2) mining timber and logs as direct sources of cash income;

(3) fodder; and,

(4) environmental benefits that would enhance the productivity of the soil and crop yields and the quality of life of the people.

The on-farm tree crop management demonstrations in NWFP and the Punjab will be aimed primarily at production by the farmer of sufficient fuelwood to meet the needs of his family, including the replacement of alternative fuels he now uses, such as dung, so that they can be used more properly as manure.

Based on field observations, it is assumed that on average a family's basic annual cooking heat requirement is 11.3 million Kilocalories (kcals) which, at a rate of 4700 kcals per kg, would be produced by 2,400 kg or 180 cu.ft. (solid) of wood. This quantity of wood is set, in the design for the component that follows, as the annual production target per participating farm family. It is to be understood, of course, that a farmer would have several reasons for planting trees and that he would have strong interest in using them as a cash crop. The actual amount that he plants, given the lead and encouragement provided by this project, would likely be greater.

ii. Production and Management Regimes

The areas that offer opportunities for tree planting on private lands suggests a range of plantation designs:

(1) block plantations and groups of trees;

(2) lines of trees along field boundaries and berms, and farm roads; trees planted in this way would have grass and other fodder-producing species under them;

(3) individual trees on field margins and about homesteads and steadings; and,

(4) widely-spaced tree plantations with fodder crops as a ground cover, the trees being lopped systematically to provide tree fodder as well as timber and fuelwood at the final felling.

In all the regimes discussed here, it is assumed that the rotation would be 20 years. Many factors could modify this; the important principle to apply, however, is that the rotation length, like other management features, should be set as a result of deliberate analysis by the farmer and his advisors, not as a result of whim or by default.

iii. Species

In the absence of over-riding requirements for specific characteristics, multi-purpose species would normally be chosen. The outstanding one for the project area is A. arabica (babul). Except in soil conservation planting or when aesthetic effects are sought, species would normally be planted in pure stands or groups because mixtures are usually not as successful as hoped for and are difficult to manage.

c. Extent of Program

i. Plantation Acreages to Meet Fuelwood Production Targets

The following table indicates the acreages of plantations of the types shown estimated to be required on an average farm in each of the three ecological zones of the Barani to meet the average farmer's annual fuelwood need of 180 cu.ft.

Table F-3: Plantation Areas to Meet Fuelwood Needs

Zone	Plantation Type	MAI /a cu.ft./ac	Acres required per farmer
Sub-humid	Block and equivalents	165	1.1
Main semiarid	"	120	1.5
Dry semiarid	"	60	3.0
Sub-humid	Lopping with ground fodder	140	1.5

/a Mean annual increment.

ii. Participation by farmers

The rate at which farmers might come forward to join the project will depend upon many factors and, despite experience in, e.g., India and Nepal, is difficult to forecast. Certainly it would - and should - be modest to begin with, but the Indian and Nepalese examples suggest that the rate can be expected to increase exponentially once the farmers see successful demonstrations represented by the pioneering efforts of their leaders, particularly if incentives are offered. It is anticipated that in this component the incentives would be that the project, apart from providing technical advice and guidance, would provide the seed, nursery stock, opportunities to make money in the nursery phase, payment for conservation works effectively done, and donated fruit trees (say one for every 100 successfully planted forest trees).

It is assumed that the first two years of the project would be taken up by preliminary activities such as staff recruitment, training and nursery construction and that the earliest actual planting would take place in the winter of 1985/86, i.e. in Project Year 1986.

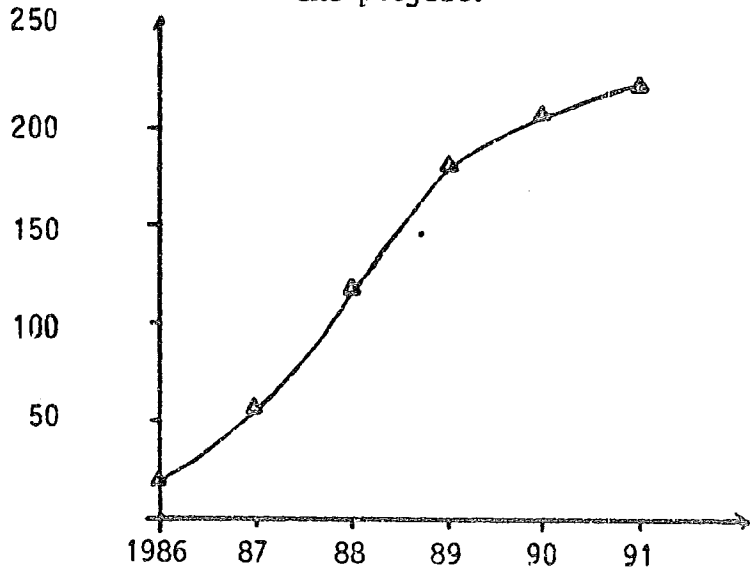
The following rate (believed to be conservative) is proposed at this stage in the project.

Table F-4: Rate at which farmers might join Project/Tehsil

Farmers planting trees for the first time in year	Number of farmers per tehsil
1986	20
1987	60
1988	120
1989	180
1990	210
1991	230

The rate is depicted in the following graphical curve.

Figure F-1: Rate at which farmers might join the project.



At the foregoing rates, the following number of farmers would join the project each year in each tehsil.

Table F-5: Farmers Joining Project

Series[a]	District	Tehsils	Year 1986	1987	1988	1989	1990	1991	Total
1	NWFP								
	Kohat	2	40	120	240	360	420	460	1,640
	Karrak	1	20	60	120	180	210	230	820
	Sub-Total	3	60	180	360	540	630	690	2,460
	Punjab								
	Rawalpindi	3	60	180	360	540	630	690	2,460
	Attock	4	80	240	480	720	840	920	3,200
	Jhelum	2	40	120	240	360	420	460	1,640
	Gujrat	2	40	120	240	360	420	460	1,640
	Sub-Total	11	220	660	1320	1980	2310	2530	9,020
	Totals Series 1	14	280	840	1680	2520	2940	3220	11,480
2		8					1680	1740	3,420
Totals, Series 1 and 2		22	280	840	1680	2520	4620	4960	14,900

a/ The total of Series 1 represents 1.66% of farmers in the tehsils, and Series 2 = 2.15%

Series 1 in the table above represents the 14 tehsils previously identified. Series 2 comprises a further 8 activity centres, each under a Farm Forestry Coordinator, the creation of which, it is assumed, would result from the demand by farmers to join the project once it gets underway. These centres may be in tehsils where project activity is already established or in adjacent tehsils.

The 14,900 farmers estimated in the foregoing table to join the project would, it is estimated on the basis of ecological and demographic information, be distributed over climatic zones as follows:

Table F-6: Stratification of farmers by climatic zones

Province	Climatic Zone	%	1986	1987	1988	1989	1990	1991	Total
NWFP	Main semiarid	60	36	108	216	324	630	675	1,989
	Dry semiarid	40	24	72	144	216	420	450	1,326
	Total		60	180	360	840	1050	1125	3,315
Punjab	Sub-humid	35	77	231	462	693	1250	1342	4,055
	Main semiarid	60	132	396	792	1188	2142	2301	6,951
	Dry semiarid	5	11	33	66	99	178	192	579
	Total		220	660	1320	1980	3570	3835	11,585
Totals, both Provinces	Sub-humid		77	231	462	693	1250	1342	4,055
	Main semiarid		168	504	1008	1512	2772	2976	8,940
	Dry semiarid		35	105	210	315	598	642	1,905
	Total		280	840	1680	2520	4620	4960	14,900

iii Planting Program

The assumptions made above and in the foregoing table lead directly to the compilation of the following program totalling 20,375 acres for the 6 planting years of the project period. One additional assumption has been made, concerning the phasing of planting of their target acreages by farmers, and this is shown in the third column of Table F-7.

Table F-7: Planting Program - Acres

Ecological Zone	Plantation Type	Acres per farm per year	1986	1987	1988	1989	1990	1991	Total
Sub-humid	Block and equivalents.	1.1 in year 1	74	232	453	685	1243	1333	4020
	Lopping	1.5 in year 1	15	30	75	105	180	195	600
Main semiarid	Block and equivalents	1 in year 1, 0.5 in year 2	168	583	1260	2016	3528	4362	11927
Dry semarid	"	1 ac in each of years 1-3	35	140	350	630	1123	1555	3833
		Totals	292	990	2138	3436	6074	7445	20375

iv. Soil Conservation Program

Soil conservation measures will also be undertaken as part of farm tree crop management in the Barani which includes much land that is eroded and frequently deeply gullied. The erosion processes are usually active in these areas.

The gullied areas, particularly those in deeper soils, offer the best farm tree planting sites since they do not require land for tree planting to be withdrawn from agricultural production. Stabilization of these areas by installing modest engineering works (check dams and the like) and tree planting would reduce loss of land and dramatically cut sediment yields. If the latter is a primary goal, soil conservation measures should be concentrated in the deeper soil landforms which yield the most sediment. Maximum benefits will be achieved by focusing on catchments that supply water to small dams.

The actual areas to be treated annually are as follows:

Table F-8: Acreages to be treated annually, by landforms

Landform	Acreage to be treated						
	1986	1987	1988	1989	1990	1991	Total
I	50	160	340	550	960	1200	3260
II	30	90	190	110	540	680	1640
III, IV	20	50	110	150	300	380	1010
V	10	30	50	80	210	260	640
Total	110	330	690	890	2010	2520	6550

3. Farm Tree Crop Management Demonstrations in the Irrigated Lands in Nasirabad Baluchistan

a. The Project Area

i. Location

Nasirabad District comprises the triangular shaped arm of the Indus Valley that lies between the Sulaiman Range to its north west and Central Brahul Range on the south west which link up in the vicinity of the Bolan Pass. The principal areas of opportunity for irrigated farm tree crops are, first, an area to the west and south west of Dera Murad Jamali as far as about Usta Muhammad and, second, the farming areas due east of the capital town in the Sohadpur area. The administrative areas concerned are Jhat Pat Tehsil, Usta Muhammad Tehsil and Dera Murad Khan Jamali Sub-Tehsil.

ii. Climate

Average annual rainfall is 5-6 inches, and its incidence is erratic. Freezing temperatures are experienced during the short winter and maximum temperatures reach 120-125°F in the summer.

iii. Landforms and Soils

The landscape is flat or nearly so, altitudes in this plains area being around 200 feet above mean sea level. The soils are alluvial, moderately to markedly clayey or silty and often somewhat saline. Serious waterlogging and salinity problems exist in parts of the District. An important feature of the landscape is that natural watercourses flowing towards Sohadpur, Dera Murad Jamali and Usta Muhammad from the hills to the north east, north and north west, become subterranean a few miles north of these localities. This condition is sometimes linked with salinity problems. Parts of area are subject to occasional flash flooding by outwash from the hills.

iv. Vegetation

The area lies within an extensive belt of the Tropical Thorn Forest type. The natural vegetation pattern of this naturally arid area has been greatly modified by land use, particularly arable cropping under irrigation. Champion et al. (1965) noted that extensive flats almost totally devoid of vegetation occured in the area.

Impressive numbers of trees (mostly A. arabica) grow along canals and field boundaries. Fair numbers are also seen growing singly in the fields. These are said by the farmers to be there as a result of seed deposited by goats.

Mining timber production was stated in the field to be an important source of income and many farmers in the area are clearly interested in growing trees.

v. Irrigation

The situation with respect to irrigation in the area is somewhat paradoxical. On the one hand the Pat Main feeder, which was commissioned in 1966 or 1967 and which flows west from the Indus just to the north of Sohadpur and Dera Murad Jamali, carries excess water which, linked with inadequate tail drainage and the naturally saline nature of soils over much of the area, has brought about the need for a major reclamation program. Land that was once highly productive is going out of production.

On the other hand, as a result of unfavourable canal levels, inadequate flow and inadequate canal maintenance, shortages of irrigation water occur in the area served by the Kirthar Canal (that was commissioned in 1932) to the south west of Dera Murad Jamali, in the vicinity of Usta Muhammad. The problem is exacerbated in some instances (e.g. FD's nursery just outside Dera Murad Jamali) when water is unavailable because of the annual 2-months closure of the system in April and May for canal maintenance.

Both problems (water-logging and shortage of water) are increased by lack of canal lining and inadequate maintenance of water courses.

The rehabilitation of the canal system and introduction of better patterns and controls of flow, are important requirements. USAID's large canal rehabilitation program (sister of this project) could help out in this area.

b. Development Strategies

i. Needs and Opportunities

Fuelwood is in short supply in this area where about 40% of the domestic fuel used is said to be dung. Mining timber is a lucrative crop and poles sell well. The farmers perceive trees as having a part to play in conditioning the soil. They also recognize the importance of shelterbelts of babul, Leucaena and Sesbania for rice nurseries and fruit crops (mango, mainly).

Farm tree crop management will be encouraged, as in the NWFP and Punjab Barani areas, in order to produce

(1) fuelwood to meet the owner's needs, to substitute for the dung that he currently uses and, if there is a surplus, for sale to produce cash;

(2) mining timbers, poles and logs as a direct source of cash;

(3) fodder; and,

(4) environmental benefits that would enhance the productivity of the soil and crop yields, and the quality of life of the people.

Again as in the Barani demonstrations, it is assumed that on average, each family's basic annual cooking heat requirement will be met from 180 cu. ft. (solid) of fuelwood. This is accordingly set as the mean annual production target per participating farmer (who might, of course, wish to plant more as a cash crop.)

ii. Production and Management Regimes

The principal plantation design to be used by the project will be single rows of trees along field margins and irrigation channels. In addition to wood, this design would permit the production on a regular basis of forage from grass or forage species either sown or growing naturally under the trees.

Block plantations would not be justified in place of agricultural crops, except possibly to improve moderately saline or excessively light soils. Tests and demonstrations of such plantations will be undertaken on a small scale.

Windbreaks and shelterbelts of long rotation, conventional type; short rotation belts of fast growing species such as Sesbania, and widely-spaced trees under-sown with forage species, the trees being lopped systematically for fodder, are other design that might be tested on a small scale in the operational if not the research program. Individual trees or small groups of trees would be planted near homesteads and elsewhere as appropriate.

Tree crops would normally be grown on a rotation of about 8 years (longer in the case of the model involving lopping of widely spaced trees). If grown for longer, trees along field margins would become so large that they would interfere unduly with arable crops.

iii. Species

The project would emphasis babul since the range of values it produces and its ecological plasticity render it an ideal tree for farm tree crop management. Small numbers of other species would, of course, also be used when appropriate; e.g., Leucaena leucocephala, Tamarix articulata and other salt tolerant species in saline areas, Zizyphus jujuba as an alternative to babul sometimes on field margins, and shade and a few fruit trees near residences and farm steadings.

c. Extent of Program

i. Plantation Acreages to Meet Fuelwood Production Targets

It is anticipated that both acre equivalents of row or single tree plantation along field margins (1000 plants equivalent to one acre) or an acre of block plantations would yield an average of 180 cu.ft. per year. Since this is the quantity, of wood required to meet a family's basic need for fuelwood, the target extent of a farmer's plantation would be one acre or its equivalent. It is assumed that he would plant this in one year.

ii. Participation by Farmers

The assumptions developed and discussed as to the rate at which farmers would join the project in the NWFP and Punjab Barani are considered to be equally applicable to the project's activities in Nasirabad.

At that rate, the numbers of farmers joining the project in the 3 tehsils of Nasirabad are estimated as shown in Table F-9:

Table F-9: Numbers of farmers joining project

Years	1986	1987	1988	1989	1990	1991	Total	%
Farmers, Series 1	60	180	360	540	630	690	2,460	
Farmers, Series 2					420	460	880	
Total Farmers	60	180	360	540	1050	1150	3,340	7.16

Series 1 in the above table represtns the 3 tehsils which comprise the project area. Series 2 comprises a further 2 centres of activity, each under a Farm Forestry Coordinator, the creation of which, it is assumed would result from demand by farmers to join the project once the project gathers momentum. It is further assumed that planting in these centres, beginning in 1990, would be undertaken by the same number of farmers per tehsil as in the tehsils where the project is established.

It is assumed that the first 2 project years will be taken up with preliminary matters and that planting would begin in the winter of 1985-86, the third project year.

iii. Planting Program

The following table shows the proposed planting program; it reflects the emphasis to be placed on row plantations along farm boundaries and irrigation channels, and equivalents, compared with the research development status of block plantations.

Table F-10: Planting Program

	Area in each year						
	1986	1987	1988	1989	1990	1991	Total
Row Plantations	50	160	330	500	1000	1090	3,130
Block Plantations	10	20	30	40	50	60	210
	60	180	360	540	1050	1150	3,340

4. Improvement and Extension of Sind Government Irrigated Plantations

a. The Project Area

i. Location and Extent

This component of the project comprises three parts, i.e. improvement of existing plantations 1-10 years old; conversion of plantations more than 10 years old, and extension of the plantation area. The following table indicates the areas 1-10 years old that require improvement, i.e. the irrigation arrangements which require renovation and the silvicultural management of which is behind schedule in some cases.

Table F-11: Plantations 1-10 years old requiring improvement

Forest Division	Reserved forest	Acres by age class 1-5	6-10	Total
Thatta	Khanani	85	335	420
	Maliriri	10	8	18
	Khaso		240	240
	Bun			
	Sub-Total	95	583	678
Kotri Barrage near Hyderabad	Mulchand	367	89	456
	Penah	405		405
	Huderani	160	119	279
	Sub-Total	932	208	1140
Totals		1027	791	1818

Plantations in the Pai and Miani/Khathar RF's near Sakrand and Hyderabad respectively are omitted because shortage of irrigation water in these two areas would involve recourse to the use of tubewells, which renders irrigated plantation forestry uneconomic.

The following table indicates the extent of plantations more than 10 years old that require improvement, both of its irrigation arrangements and silviculturally. The only feasible strategy to apply to these stands is to convert them to new plantations by felling them, selling the timber, and establishing plantations in their place that measure up to currently accepted standards of irrigation engineering and practice and silviculture. The following table indicates the acreages of plantations requiring treatment in this way.

Table F-12: Plantations over 10 years Old Requiring Conversion

Forest Division	Reserved Forest	Acres Over 10 years
Thatta	Khanani	330
	Maliriri	270
	Khaso	-
	Bun	60
	Sub-Total	660
Kotri Banage	Mulchand	790
	Penah	1500
	Huderani	250
	Sub-Total	2540
Total		3200

Again plantations in this category at Pai and in the Miani area have been excluded because of shortage of irrigation water. A development and demonstration program for some 550 acres of stands in this category in the Thatta and Kotri Barrage Forest Divisions is proposed. The project will pay for the mechanical levelling of the land and the new or renovated irrigation arrangements entailed. The actual areas selected for treatment will be chosen on the basis, first, of water availability (there is some question about this in Kotri Barrage Division), second, to avoid saline or waterlogged areas or areas where the water table is sufficiently close to the surface to cause concern for the future, and third, to bring in maximum revenues that can be devoted to additional areas.

Finally, 3000 acres of land in Thatta Forest Division and 4,600 acres in Kotri Barrage are available, with irrigation water sanctioned, for extension of the plantation area. The project would fund land levelling and development of irrigation works in some 400 acres of such land, the specific areas being selected according to the criteria given in the previous paragraph for conversion areas.

These areas all lie outside the flood control bunds in the Indus Valley at elevations below 100 feet a.m.s.l. No areas between the bunds will be included in the project because of the irregular nature of water supply there and the high cost of using water by pumping from the river and shallow wells.

ii. Climate

Rainfall in the area averages 5-7 inches per annum. It is erratic, most of it falling in July-September and a little in February-April.

At Hyderabad, where the average rainfall is between 6 annum, the following features apply:

Mean max. temperature, summer	104°F
Mean min. temperature, summer	73°F
Mean max. temperature, winter	75°C
Mean min. temperature, winter	52°C
Absolute max. temperature	120°C
Absolute min. temperature	30°C
Mean relative humidity at 8 a.m.	
Summer	52%
Winter	42%
Mean annual evaporation	1990mm

iii. Landform and Soils

Topographically the area is a flat plain, featureless save for the Indus and the man-made flood control, irrigation and other structures that have been added. Local depressions and undulations involving changes in level of rarely more than 2-3 feet are common. They either cause or are related to apparent variations in soil drainage. So flat is the general aspect of the plain however, that the low mounds of blown sand collected by tough perennial shrubs and grasses assume some importance as landscape features. Some topography has been brought about as a result of changes in the course of the river.

The widespread use of irrigation has greatly modified the hydrology of the area and brought about varying degrees of salinity and water-logging. These characteristics are to a certain extent natural, widespread areas of the Thatta Division being lightly to more heavily saline.

Fertility of the soils is generally favourable, except where salinity is a feature. Drainage is often poor.

iv. Vegetation

As a result of land use, including irrigation, the natural vegetation has been removed or greatly modified. Undeveloped Reserved Forest areas contain remnants, however, in which Salvadora persica, S. oleoides, Tamarix articulata, T. diocia, Euphorbia caducifolia and Capparis aphylla are prominent, with Acacia arabica, A. sengal, Prosopis cineraria and Zizyphus jujuba along river banks and in better drained areas. Ground vegetation includes such hardy species as Suaeda fruticosa, Calligonum, and Salsola.

v. The Irrigation Setting

Irrigation water allocations, including a number in the Thatta District in 1963, have been made to the forest department over a long period. Although in theory they have been sufficient for some 64,000 of the 180,000 acres of Reserved Forests that have been set aside since 1880, the allocations have only served the 24,000 acres of plantations that have been planted to date. Meantime, irrigated agriculture has been expanding, demands for irrigation water have increased, and it is doubtful whether the full allocations will continue to be available. Discussions with provincial officials indicated that a reasonable assumption for water availability would be 75% of the current allocations to forestry.

Careful analysis of the availability of sanctioned water as well as the gradient suitability and physical condition of the distribution system is essential before development funds are spent on irrigated plantation extensions or improvement of old ones. Areas at the tail end of canal systems should receive particularly close attention in these respects.

b. Development Strategies

i. Needs to be Met

The production objectives of the irrigated plantation improvement and expansion phases of this component are:

(1) to expand the production of fuelwood, both in total and per unit area, to meet the unsatisfied yet still growing needs of Sind and Baluchistan for this commodity; and,

(2) to expand the production and improve the quality of mining timber to meet the requirements of Pakistan's growing coal mining industry in Sind and Baluchistan.

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Implied in these objectives is the notion of expanding production, not only by increasing the area of plantations, but more importantly, by increasing and improving the quality of yields per unit area. These goals will only be attained through thoughtful work by the planning, administrative and field staff concerned in thinking out afresh, putting together, and then implementing all the know-how and other resources available to them.

ii. Design

Decisions about what species to use, how to grow them, when to thin, prune and clear fell them, begin with a clear definition of the products required and realistic conceptualization of the biologically-sound, economically-favourable regimes and rotations that would produce them. Good, economic management demands that what is done be done deliberately, based on realistic appraisal of stand development in relation to market needs, and deleberate decision making. The same analytical approach should be used to answer questions concerning the best way to go about improving existing stands.

iii. Species Selection

There is no questioning the pre-eminence of babul in relation to the required outputs and its silvicultural suitability over much of the area. However, there are good silvicultural reasons why other species known to succeed in the area should also be grown, though collectively on a much smaller scale. These include Eucalyptus camaldulensis, E. microtheca, Conocarpus lancifolius, Albizzia procera and Leucaena leucocephala with possibly others such as Casurinas to come in the future, after research trials. To use other species (but not in mixtures; they often fail as such and are difficult to manage) diversifies overall production, offsets the disadvantages of monocultures and permits sensitive matching of species with variations in site characteristics.

Since babul is the only species currently acceptable for mining timbers, its properties for this purpose should be identified and alternative species selected accordingly, for both silvicultural and service trials.

iv. Seed

One of the reasons for the sub-optimal quality and rate of growth of many of the existing plantations is low genetic quality. This is evident from the otherwise unexplainable tree-to-tree variation commonly seen in a stand.

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Genetic improvement, which has doubled, tripled or even qua -led, yields in other places, is urgently required in the Sind irri,ated plantations, particularly of the species most commonly used. Measures to be taken under the DFO Silva at Miani, for the production of seed of good genetic and physiological quality are proposed.

Seed storage and handling equipment will be provided at the forest Research Station at Miani to ensure efficiency in the procurement and use of genetically improved seed, which will be a little more costly than that used now.

To improve the uniformity and speed of germination, pre-sowing treatment should be applied as standard practice to the seed of most species used particularly leguminous species like babul.

v. Operational Sub-components

(1) Improvement of 1-10 year old plantations

An area of 1,818 acres is to be treated under this sub-component.

The object will be to upgrade these stands as soon as reasonably possible and thus achieve stand densities and yields as close as possible to the ideal. Each stand concerned will be inspected as to its condition and the relative urgency for treatment. Thereafter good judgement will be exercised in deciding whether and what treatment to apply, or whether to clear fell and re-establish if it is unlikely to respond adequately to improvement treatment.

It is assumed that irrigation systems would be renovated in all stands during the three years 1985-87, the annual acreages being 340 in 1985, 650 in 1986 and 828 in 1987. This is the operation for which the project would pay the costs.

Based on minimal field work, the plantation lists available, and the assumption that work cannot begin before 1985, the following schedule has been prepared to show the apparent 1-year age class distribution of these stands and the years when the silvicultural treatments, and clear felling, might take place to accord as closely as possible with the ideal. It is stressed that this list is schematic, developed to illustrate what is proposed and as a realistic basis for estimating costs. Actual schedules would have to be prepared after detailed reconnaissance. The schedule that follows indicates a relatively large program in 1985 if all or nearly all the stands are to be saved.

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Table F-13: Age class Statement and Silviculture Treatment Schedule: Plantations 1-10 years old

Age in 1983	Acres	Weed	Clean Prune	Prune to 6-8 feet	Thin to 700 stems	Prune relatively	Thin to 350 stems	Clear fell
1	165	1985	1985	1986	1987	1987	1990	1993
2	225	1985	1985	1985	1986	1986	1989	1992
3	247		1985	1985	1985	1985	1988	1991
4	245				1985	1985	1987	1990
5	340						1986	1989
6	318						1985	1988
7	278						1985	1987
	1818							

It is estimated (provisionally) that operations conducted in accordance with the type of schedule shown above would result in some 75% of the value yields that would come from stands managed properly from the start. About a third of this volume (25%) might be directly attributable to the project.

The revenues accruing from the clear felling schedule in the last column of the foregoing table would be used to repair the irrigation structures and to regenerate the areas. Excess revenues should be used to expand the extension program.

(2) Conversion of Plantations Over 10 years old

This sub-component will be applied over 550 acres. AID will cover the costs of clearing and levelling the site after harvesting the former crop, remodelling the irrigation works, final levelling, rinsing and application of gypsum if necessary.

The proposed program is shown in the following table:

Table F-14 Program of Converting Plantations Over 10 years old

Year		Acres
1986		50
1987		100
1988		100
1989		100
1990		100
1991		100
	Total	550

(3) Extension of Plantation Area

The program of 400 acres of plantation extension, conducted, like the conversion program above, is indicated in the following table.

Table F-15: Program for Plantation Extension

Year		Acres
1987		50
1988		50
1989		100
1990		100
1991		100
	Total:	400

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable : USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

THE DIRECTOR

USAID/PAKISTAN MISSION DIRECTOR'S WAIVER FOR A.I.D. PAYMENT OF INTERNATIONAL PARTICIPANT TRAVEL COSTS

A.I.D. Handbook 10, Chapter 15B1, provides that the cost of international travel, including incidental costs en route as well as the cost of travel between the participant's city and the points of departure and return in the participant's home country, shall be paid by the host government or other sponsor unless, in the case of Mission-funded programs, the Mission Director has justified and authorized full or partial waivers and has so notified S&T/IT.

Training and institution-building are important components of the $1.625 billion economic assistance program negotiated between the Governments of the U.S. and Pakistan. USAID/Pakistan's experience, however, has been that the Government of Pakistan (GOP), due to serious foreign exchange and budgetary constraints, has been historically unable to fund international travel costs for short-term training programs. The consequence has been that Pakistani participants have, on numerous occasions, been denied worthwhile and much needed training, inhibiting the achievement of project targets.

I have carefully reviewed the advisability of requiring full GOP funding for travel costs for participant training of one year or less and the alternative of funding such travel with grant and loan funds provided through USAID/Pakistan to the GOP. Recognizing the objectives of many of our projects and the fact that project success will be enhanced by encouraging opportunities for short-term training, I have determined that it would be prejudicial to U.S. interests to require that the GOP pay the entire international participant travel costs for training programs of one year or less.

Therefore, on all Mission-funded training programs up to and including one year, USAID/Pakistan shall be responsible for the entire cost of the round-trip economy class air ticket and other necessary incidental costs en route. Where a PIO/P has been originally written for a program of one year or less, but, after the participant has initiated his or her program, the program is extended so that it exceeds one year in total, USAID/Pakistan shall also fund the round-trip ticket. The justification for funding programs that are extended is to minimize administrative problems which are otherwise likely to occur.

On the basis of the above justification and pursuant to Handbook 10, Chapter 15B1a, I, Donor M. Lion, principal officer of the Agency for International Development in Pakistan, do hereby waive the requirement that the host government fully fund international travel for training courses of one year or less and authorize payment with USAID/Pakistan loan and grant funds for travel costs as specified above.

Donor M. Lion

Donor M. Lion
Director
USAID/Pakistan

March 17, 1982

Date

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DRAFT PROJECT AUTHORIZATION

Name of Project: Forestry Planning and Development

Number of Project: 391-0481

Pakistan

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Forestry Planning and Development Project for the Islamic Republic of Pakistan involving planned obligations of not to exceed U.S. dollars twenty-five million ($25,000,000) in Economic Support Funds over a four (4) year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project.

2. The Project is designed to increase Pakistan's energy self-sufficiency and to reduce deforestation by assisting the Government of Pakistan (GOP) to formulate and implement plans and programs to assess, develop, and use Pakistan's indigenous forest and fuelwood resources and to increase the efficiency of their production and use. This will be accomplished by, among other things, strengthening the capability of the GOP to: (a) undertake effective integrated and provincial analyses of forest and fuelwood development strategies in order to support financially sound GOP forest and fuelwood policy development and planning; (b) develop and implement programs to encourage farm and energy forestry, primarily on private lands; and (c) develop and conduct a program of research to design and evaluate on-farm tree crop management strategies that enhance the production of conventional agricultural crops while producing fuelwood, fodder, and timber.

3. The Project Agreement(s) which may be negotiated and executed by the officer(s) 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. Source and Origin of Goods and Services

Goods and services financed by A.I.D. under this Project shall have their source and origin in the Cooperating Country or in the United States, 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 United States and the Cooperating Country.

b. Conditions Precedent to Initial Disbursement for Farm and Energy Forestry Field Operations

Except as A.I.D. may otherwise agree in writing, prior to the disbursement of funds for activities under the Farm and Energy Forestry Field Operations component of this project other than for technical assistance, vehicles, household/office furniture, and other equipment for said technicians, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee, acting through its Ministry of Food, Agriculture and Cooperatives, shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D., documentary evidence that:

i. an administrative unit has been authorized and established within the Ministry of Food, Agriculture and Cooperatives to manage all project component activities; the authorities, duties and responsibilities of the overall manager for the administrative unit have been adequately defined; an adequately trained and experienced overall manager of the administrative unit has been appointed; and sufficient support staff have been appointed to enable the manager to carry out his duties effectively;

ii. a unit within the Pakistan Forest Institute has been authorized, established, and adequately staffed to assume responsibility for designing and implementing professional curricula for farm and energy forestry;

iii. a management system has been developed to identify, select, approve, implement, monitor and certify completion of Farm and Energy Forestry Field activities; and,

iv. the mechanisms by which A.I.D. will fund Farm and Energy Forestry Field activities have been jointly agreed to.

c. Conditions Precedent to Initial Disbursement for Activities under the Farm and Energy Forestry Field Operations Component in a Specific Province

Except as A.I.D. may otherwise agree in wirting, prior to any disbursement for activities in a specific province pursuant to the Farm and Energy Forestry Field Operations component of this project, other than for technical assistance, vehicles, household/office furniture, and other equipment for said technicians, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee, acting through its Ministry of Food, Agriculture and Cooperatives, shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D., documentary evidence that:

i. an administrative unit has been authorized and established within the Forest Department for that province for which the disbursement is sought to manage all project component activities within the Province; the authorities, duties and responsibilities of the overall manager for

that administrative unit have been adequately defined; an adequately trained and experienced overall manager has been appointed for that unit; and sufficient support staff have been appointed to enable the manager to carry out his duties effectively; and,

ii. a plan of training, acceptable to A.I.D., including a schedule of training adequate to provide the staff skills needed for the project, has been authorized and approved by the Provincial Government for that province for which the disbursement is sought and individuals have been identified for each training slot for the 12 months following the date of authorization and approval of said plan and schedule.

d. Covenants as to the Establishment of a Federal Advisory Committee for Farm and Energy Forestry

The Grantee shall assure that a Federal Advisory Committee for Farm and Energy Forestry is established, holds regularly scheduled meetings, and serves as a review and advisory body for overall implementation of the project. This committee shall include, at a minimum, representatives of the Ministries of Food, Agriculture, and Cooperatives, Planning and Development, and Petroleum and Natural Resources and of each of the Provinces.

e. Covenant as to Monitoring and Evaluation

The Grantee shall, in furtherance of adequate monitoring and evaluation:

i. carry out a scheduled monitoring program acceptable to A.I.D. which shall include periodic site visits to ensure the proper implementation of various project elements;

ii. provide A.I.D. with copies of all internal monitoring information and written reports of all review activities; and

iii. provide for the designated Federal and Provincial project directors, the A.I.D. Project Officer, the Technical Assistance Team Leader, and others as appropriate, to hold periodic review meetings for the purpose of evaluating project progress and requirements.

f. Covenant as to External Evaluation

The Grantee shall participate in periodic external project evaluations by assigning senior representatives of participating ministries and agencies to joint A.I.D. - Grantee Evaluation Teams.

g. Covenant as to Participant Training

The Grantee, acting through its Federal Ministry of Food, Agriculture and Cooperatives, and each of the participating provinces in the Project, shall make every reasonable effort to require that each person trained under this project works in activities related to farm and energy forestry in Pakistan for not less than three times the length of time of his or her training program; provided, however, that in no event shall the individual be allowed to work in farm and energy forestry activities for less than one year nor be required to work in farm and energy forestry activities for more than five years from the date of the individual's completion of training.

h. Covenant as to Farm Forestry Initiatives

The Grantee shall examine strategies to limit grazing on afforested lands, to ensure adequate tree crop management on private farm land, and encourage reafforestation after the harvest. The Grantee shall provide written reports to A.I.D. describing progress in these areas every 24 months from the date of the signing of this Agreement.

i. Covenant as to Maintenance of Project Equipment, Vehicles, and Commodities

The Grantee shall ensure adequate maintenance for all heavy equipment, vehicles, and durable commodities and provide a periodic training program for equipment operators and maintenance personnel. The Grantee shall provide written reports to A.I.D. describing its actions in these areas every 24 months from the date of the signing of this Agreement.

Approved: _____
M. Peter McPherson
Administrator

Date: _____

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ANNEX I

Page 1

CLASS: UNCLASSIFIED
CHRGE: AID 6/12/83
APPRV: DIR(A):JSTONE
DRFTD: E&E:SAHASSAN/CHE
:SJ
CLEAR: 1.E&E:CMOSELEY
DISTR: AMB DCM ECON
AID 12

AIDAC

FOR ASIA/PD - VAN RAALTE

.C.12356 N/A
SUBJECT: FORESTRY PLANNING AND DEVELOPMENT PROJECT (391-0481): DRAFT CONGRESSIONAL NOTIFICATION

1. THIS CABLE TRANSMITS DRAFT LANGUAGE FOR THE C.N. FOR THE SUBJECT PROJECT. MISSION PLANS TO SUBMIT PP TO AID/W MID TO LATE JULY AND WILL ADVISE FIRM DATE OF SUBMISSION WHEN KNOWN.

2. ACTIVITY DATA SHEET:

COUNTRY: PAKISTAN
TITLE: FORESTRY PLANNING AND DEVELOPMENT
NUMBER: 391-0481
APPROPRIATION CATEGORY: ECONOMIC SUPPORT FUNDS
LIFE OF PROJECT: FY 1983 - FY 1991
PROPOSED OBLIGATION: FY 1983 - 7,000,000
" " LOP - 25,000,000
INITIAL OBLIGATION: FY 1983
ESTIMATED FINAL OBLIGATION: FY 1986

3. NARRATIVE IS AS FOLLOWS:

PURPOSE: TO ASSIST THE GOVERNMENT OF PAKISTAN (GOP) TO STRENGTHEN THE CAPABILITY OF FEDERAL, PROVINCIAL, AND LOCAL INSTITUTIONS TO DESIGN, IMPLEMENT AND EVALUATE POLICIES AND PROGRAMS FOR INCREASING THE PRODUCTION OF FUELWOOD AND TIMBER IN PAKISTAN.

BACKGROUND: PRODUCTIVE FOREST LAND OCCUPIES ABOUT 1.2 MILLION HECTARES IN PAKISTAN OR LESS THAN 2 PERCENT OF THE COUNTRY'S TOTAL AREA. THIS IS ONE OF THE LOWEST FOREST/LAND RATIOS IN THE WORLD AND IS A MAJOR CONSTRAINT TO NATIONAL DEVELOPMENT. ACCORDING TO THE WORLD BANK AND THE PAKISTAN FOREST INSTITUTE, THESE NATURAL FORESTS PROVIDE LESS THAN ONE-FIFTH OF THE TIMBER USED IN PRODUCING THE FOREST PRODUCTS CONSUMED IN PAKISTAN AND ONLY ONE-FOURTH OF THE FUELWOOD. DESPITE PAKISTAN'S LIMITED FOREST AREA AND POOR FOREST PRODUCTIVITY, FUELWOOD PLAYS A MAJOR ROLE AS AN ENERGY RESOURCE WITHIN THE COUNTRY. BECAUSE OF LIMITED INDIGENOUS SUPPLIES OF FOSSIL FUELS, ROUGHLY 90 PERCENT OF THE RURAL POPULATION AND 50 PERCENT OF THE URBAN POPULATION USE TRADITIONAL FUELS. FULEWOOD, THE HIGHEST QUALITY AND MOST CONVENIENT

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OF THE TRADITICNAL FU. .S, ALONE PROVIDES ABOUT O. -HALF OF THE DOMESTIC SECTOR'S COOKING AND HEATING REQUIREMENTS. INCREASES IN THE COST OF ALTERNATIVE ENERGY SOURCES, THE ANNUAL POPULATION GROWTH RATE OF 3 PERCENT, AND THE INFLUX OF ALMOST THREE MILLION WOOD-BURNING AFGHAN REFUGEES, COMBINE TO SUSTAIN INCREASES IN THE DEMAND FOR FUELWOOD. WITHOUT EFFECTIVE REFORESTATION PROGRAMS, WIDESPREAD DEFORESTATION WILL CONTINUE UNABATED. THE FUELWOOD HARVEST IN PAKISTAN NOW EXCEEDS 16.3 MILLION CUBIC METERS OF WOOD ANNUALLY, BUT THE ANNUAL GROWTH OF WOOD FIBRE IS APPROXIMATELY 11.3 MILLION CUBIC METERS PER YEAR. CONSEQUENTLY, PAKISTAN'S INVENTORY OF WOOD RESOURCES IS DECLINING RAPIDLY WITH THE FAR-REACHING NEGATIVE EFFECTS OF DEFORESTATION THAT INCLUDE EROSION, SILTATION OF THE COUNTRY'S HYDROELECTRIC RESERVOIRS AND EXTENSIVE IRRIGATION CANAL SYSTEM, LOSS OF PRODUCTIVE SOILS, DESTRUCTION OF ECOLOGICAL BALANCE, AND DECREASING CAPABILITY TO MEET HUMAN NEEDS FOR WOOD PRODUCTS.

PROJECT DESCRIPTION: THE PROPOSED PROJECT CONSISTS OF A DOLS 25 MILLION ESF GRANT OVER A PERIOD OF EIGHT YEARS TO FINANCE A PROGRAM OF MANPOWER TRAINING, INSTITUTIONAL DEVELOPMENT, RESEARCH, AND OPERATIONAL ACTIVITIES TO ENHANCE PAKISTAN'S CAPABILITY TO DEVELOP EFFECTIVE FORESTRY PROGRAMS AND TO ASSIST FARMERS IN PLANTING TREES ON PRIVATE LANDS. THE PROJECT WILL BE CARRIED OUT BY THE MINISTRY OF FOOD, AGRICULTURE AND COOPERATIVES AND THE PROVINCIAL FOREST DEPARTMENTS WHICH WILL ENCOURAGE THE PRODUCTION OF SEEDLINGS AT PRIVATELY-OWNED NURSERIES FOR THE USE OF FARMERS ON PRIVATE LANDS. THE PROJECT WILL FINANCE: (A) TECHNICAL ASSISTANCE TO THE FORESTRY DEPARTMENTS AND FARMERS; (B) LONG AND SHORT-TERM TRAINING FOR MEMBERS OF THE FORESTRY DEPARTMENTS, RELATED INSTITUTIONS, AND FARMERS; (C) COMMODITIES; (D) A MAJOR PORTION OF THE LOCAL COSTS REQUIRED TO IMPLEMENT THE PROGRAM; AND, (E) SUPPORT FOR A RELATED PROGRAM OF RESEARCH IN THE SOCIO-ECONOMIC AND TECHNICAL ASPECTS OF FARM AND ENERGY FORESTRY.

T: PROGRAM AIMS TO: (A) IMPROVE AND STRENGTHEN PAKISTAN'S STITUTIONAL CAPABILITY TO DEVELOP FOREST POLICIES AND PLAN A D MANAGE EFFECTIVE FORESTRY PROGRAMS; (B) ASSIST

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THE GOP IN DEVELOPING AN EFFECTIVE PLAN TO INCREASE PRIVATE SECTOR PRODUCTION OF WOOD, AND TO ASSIST IN ITS IMPLEMENTATION; (C) DEMONSTRATE THE ECONOMIC, TECHNICAL, AND SOCIAL FEASIBILITY OF PRODUCING TREE CROPS ON PRIVATELY-OWNED FARM AND RANGE LANDS; (D) ASSIST THE GOP IN CONDUCTING FUELWOOD DEMAND AND MARKETING ANALYSES, INCLUDING ASSISTANCE FOR SOCIO-ECONOMIC RESEARCH RELATING TO FUELWOOD USE; (E) ESTABLISH A PROGRAM OF RESEARCH TO DESIGN AND EVALUATE ALTERNATIVE METHODS FOR ENHANCING AGRICULTURAL PRODUCTIVITY THROUGH FUELWOOD PLANTING; AND, (F) STRENGTHEN EXISTING FORESTRY RESEARCH EFFORTS BY PROVIDING RESEARCH GRANT FUNDS TO UNIVERSITIES AND REGIONAL RESEARCH STATIONS TO ASSIST IN RESEARCH COORDINATION AND EXTENSION ACTIVITIES, AND TO FUND SCIENTIFIC EXCHANGE PROGRAMS.

RELATIONSHIP OF THE PROJECT TO A.I.D. COUNTRY STRATEGY: THIS PROJECT WILL FOCUS IN PARTICULAR ON DEVELOPING AN EFFECTIVE INSTITUTIONAL FRAMEWORK FOR ADDRESSING A BASIC NEED OF THE RURAL POOR AND THEREFORE HAS A DIRECT RELATIONSHIP TO A.I.D.'S SECTOR STRATEGY FOR RURAL DEVELOPMENT IN PAKISTAN. A.I.D.'S SECTOR STRATEGIES FOR ENERGY AND FORESTRY GIVE HIGH PRIORITY TO SUPPORTING THE ENERGY AND RELATED FORESTRY PROGRAMS WITHIN THE CONTEXT OF OVERALL SUPPORT FOR PLANNING AND HUMAN RESOURCES DEVELOPMENT IN ENERGY SECTOR ACTIVITIES. THE PROBLEMS OF RISING OIL PRICES AND SHORTAGES OF FUELWOOD AND OTHER TRADITIONAL ENERGY SOURCES ARE BECOMING MORE ACUTE AND SERIOUSLY THREATEN DEVELOPMENT EFFORTS IN PAKISTAN. THIS PROJECT IS CONSISTENT WITH BOTH A.I.D.'S AND THE GOVERNMENT OF PAKISTAN'S PRIORITIES OF CONSERVING PAKISTAN'S SCARCE FOREIGN EXCHANGE AND ASSISTING ITS RURAL AREAS. IT IS EXPECTED THAT THE EXPANDED USE OF FUELWOOD FOR DOMESTIC USES WILL HELP ALLEVIATE THE FOREIGN EXCHANGE DRAIN CAUSED BY HIGH LEVELS OF PETROLEUM IMPORTS.

BENEFICIARIES: THE PRINCIPAL BENEFICIARIES OF THIS PROJECT WILL BE PAKISTAN'S RURAL POOR, FARMERS WITH SMALL LAND HOLDINGS, AND WOMEN AND CHILDREN WHO COLLECT FIREWOOD AND MUST WALK CONSIDERABLE DISTANCES TO DO SO. EVENTUALLY, THE ENTIRE COUNTRY WILL BENEFIT FROM INCREASED FUELWOOD SUPPLIES AND THE POSITIVE ENVIRONMENTAL IMPACT OF REFORESTATION OF WATERSHED AND MARGINAL LANDS. BALANCE OF PAYMENTS PRESSURE SHOULD ALSO BE EASED AS THE AVAILABILITY OF TRADITIONAL FUEL IS INCREASED.

HOST COUNTRY AND OTHER DONORS: THE GOP IS EXPECTED TO CONTRIBUTE THE EQUIVALENT OF APPROXIMATELY DOLS 8.0 MILLION TO THIS PROJECT, IN THE FORM OF STAFF SALARIES AND RELATED COSTS, IN-COUNTRY TUITION FOR PROFESSIONAL TRAINING, ALL RECURRENT OFFICE COSTS, 25 PERCENT OF THE COSTS OF FARMER TRAINING, ALL VEHICLE AND EQUIPMENT OPERATIONAL AND MAINTENANCE COSTS, AND A PORTION OF THE COSTS OF FIELD OPERATIONS AND CONSTRUCTION. THE WORLD BANK, ASIAN DEVELOPMENT BANK, UNITED NATIONS DEVELOPMENT PROGRAM, FOOD AND AGRICULTURE ORGANIZATION, WORLD FOOD

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PROGRAM, UNITED NATIONS HIGH COMMISSION FOR REFUGEES, AND ILATERAL DONORS INCLUDING SWITZERLAND AND GERMANY ARE PROVIDING, OR PLAN TO PROVIDE, SUPPORT FOR FORESTRY ACTIVITIES IN PAKISTAN. THE WORLD BANK, FAO, AND UNDP ARE SUPPORTING PLANNING PROJECTS THAT WILL LEAD TO INTENSIFIED MANAGEMENT OF PAKISTAN'S NATURAL FORESTS IN THE NORTHWEST FRONTIER PROVINCE AND AZAD KASHMIR. GERMANY AND SWITZERLAND HAVE BOTH ESTABLISHED PROJECTS TO IMPROVE THE MANAGEMENT OF THE NATURAL FORESTS IN NWFP. THE ADB PLANS A PROJECT TO INTENSIFY THE MANAGEMENT OF GOVERNMENT FOREST PLANTATIONS IN THE PUNJAB. ACTIVITIES TO ENCOURAGE FORESTRY ACTIVITIES ON PRIVATE LANDS ARE BEING CONDUCTED IN MOUNTAINOUS WATERSHED AREAS OF THE NWFP BY THE WFP AND ON A SMALL SCALE BY UNHCR. ALL THESE PROGRAMS CONTRIBUTE TO PAKISTAN'S FORESTRY NEEDS. HOWEVER, ALL OF THESE ACTIVITIES ADDRESS THE PRODUCTION OF FOREST PRODUCTS WHICH REPRESENT ONLY 11 PERCENT OF THE TOTAL USE OF PAKISTAN'S WOOD RESOURCES. NO PROJECT SPECIFICALLY ADDRESSES THE IMPORTANCE OF WOOD IN PAKISTAN'S ENERGY SECTOR. NO PROJECT PROVIDES THE TECHNICAL ASSISTANCE AND TRAINING NECESSARY TO ASSIST PAKISTAN IN DEVELOPING A COMPREHENSIVE WOD RESOURCE POLICY AND IN PLANNING AN EFFICIENT STRATEGY FOR ITS IMPLEMENTATION. FURTHERMORE, NO PROJECT PROVIDES THE TRAINING AND TECHNICAL ASSISTANCE THAT IS ESSENTIAL IF PAKISTAN IS TO DEVELOP OUTREACH PROGRAMS THAT SUCCESSFULLY ENCOURAGE FARMERS TO ESTABLISH TREE CROPS ON THEIR MARGINAL FARM AND RANGE

LANDS. THE A.I.D. PROJECT WILL PROVIDE ASSISTANCE TO FILL THESE GAPS THAT MUST BE OVERCOME IF PAKISTAN IS TO REVERSE THE DEPLETION OF ITS WOOD RESOURCES AND TAKE ADVANTAGE OF THE DEVELOPMENT OPPORTUNITIES THAT INCREASED WOOD PRODUCTION COULD PROVIDE.

MAJOR OUTPUTS:

A. ESTABLISHMENT AND TRAINING OF A FEDERAL FORESTRY POLICY AND ANALYSIS TEAM WITH STAFF RESPONSIBILITY FOR COORDINATING, EVALUATING, AND JUSTIFYING FEDERAL FORESTRY POLICIES AND BUDGETARY ALLOCATIONS; THIS TEAM WILL ALSO BE GIVEN MANAGEMENT AND REVIEW RESPONSIBILITIES WITH RESPECT TO IMPLEMENTATION OF THE PROJECT;

. ESTABLISHMENT AND TRAINING OF PROVINCIAL FORESTRY PLANNING TEAMS WITH ECONOMIC, SOCIOLOGICAL, AND TECHNICAL SKILLS NECESSARY FOR PROJECT IDENTIFICATION, FEASIBILITY ASSESSMENT, AND EVALUATION;

C. DEVELOPMENT OF A LONG-TERM PROGRAM PLAN THAT WILL GUIDE THE COORDINATED DEVELOPMENT OF FOREST AND FUELWOOD RESOURCES ON BOTH PUBLIC AND PRIVATE LANDS IN PAKISTAN;

STRENGTHENING OF PROVINCIAL FOREST DEPARTMENT INFRASTRUCTURES FOR THE IMPLEMENTATION OF TREE CROP MANAGEMENT PROGRAMS ON PRIVATELY-OWNED FARM AND RANGE LANDS IN THE PUNJAB, NWFP, AND BALUCHISTAN PROVINCES;

E. DEMONSTRATION OF FARM AND RANGE LAND TREE CROP MANAGEMENT OPPORTUNITIES IN SIX OR MORE LOCATIONS IN THE PUNJAB, NWFP, AND BALUCHISTAN WITH THE TOTAL AREA TREATED APPROXIMATELY 20,000 - 30,000 ACRES;

F. IMPROVED MANAGEMENT OF APPROXIMATELY 2,500 ACRES OF EXISTING GOVERNMENT FOREST PLANTATIONS IN SIND AND THE DEVELOPMENT OF APPROXIMATELY 1,500 ADDITIONAL ACRES OF GOVERNMENT FOREST PLANTATIONS;

G. ESTABLISHMENT OF A FARM AND RANGE LAND TREE CROP MANAGEMENT RESEARCH PROGRAM TO DESIGN AND EVALUATE TECHNICALLY FEASIBLE AND ECONOMICALLY VIABLE STRATEGIES FOR PRODUCING TREES WHILE ENHANCING AGRICULTURAL PRODUCTIVITY;

H. ESTABLISHMENT OF A TRAINING PROGRAM AS PART OF A STRENGTHENED CURRICULUM AT THE PAKISTAN FOREST INSTITUTE TO PROVIDE THE PERSONNEL NEEDED TO STAFF THE POLICY AND PLANNING CELLS AND TO STAFF THE FARM AND ENERGY FORESTRY PROGRAMS IN THE PROVINCES.

I. PRODUCTION OF APPROXIMATELY 50 MILLION CUBIC FEET OF FIREWOOD AND APPROXIMATELY 4 MILLION CUBIC FEET OF TIMBER;

J. PROVISION OF TRAINING OPPORTUNITIES FOR THE NUMBER OF

INDIVIDUALS LISTED I. THE CATEGORIES BELOW:

- I. LONG-TERM OVERSEAS -- 27
- II. SHORT-TERM OVERSEAS -- 108
- III. LONG-TERM IN-COUNTRY -- 78
- IV. SHORT-TERM IN-COUNTRY -- 304
- V. FARMER-DAYS OF LOCAL TRAINING -- 57,500;

K. AS' STANCE TO APPROXIMATELY 18,000 FARMERS IN PLANTING TREES ON 26,000 ACRES OF SUB-MARGINAL AGRICULTURAL LAND.

A.I.D. FINANCED INPUTS	LIFE OF PROJECT (DOLS 000)
TECHNICAL ASSISTANCE	7,000
TRAINING	2,800
OPERATIONAL ACTIVITIES	12,000
COMMODITIES	1,000
CONTINGENCY	2,200
TOTAL	25,000

U.S. FINANCING:

PROPOSED FY 83: OBLIGATIONS	7,000,000
FUTURE YEAR OBLIGATIONS	18,000,000
ESTIMATED TOTAL	25,000,000

PRINCIPAL CONTRACTORS OR AGENCY: U.S. CONTRACTORS

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SELECTED IN ACCORDANCE WITH A.I.D. COMPETITIVE PROCEDURES.
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DRAFT PROJECT DESCRIPTION FOR INCLUSION IN THE PROJECT AGREEMENT

A. Project Goal and Purpose

The primary goal of the Forestry Planning and Development Project is to help Pakistan increase its indigenous energy supplies and achieve energy self-sufficiency. The secondary goal is to reverse the process of deforestation in Pakistan and to expand the extremely limited forest base. The primary purpose of the project is to strengthen the capability of federal, provincial, and local institutions to design, implement, and evaluate policies and programs for increasing the production of fuelwood and timber in Pakistan. The secondary purpose of the project is to demonstrate the economic, technical, and social feasibility of producing tree crops on privately-owned farm and range lands.

These goals and purposes will be achieved by strengthening the capability of the Government of Pakistan to: (1) collect data, conduct systematic analyses, and develop integrated federal and provincial plans for the cost-effective development of forest resources on the public and private lands of the country; (2) design, assess, justify, and evaluate specific forest development projects that meet the needs of the people; (3) develop and conduct a program of research leading to the design of improved farm forestry management systems that produce fuelwood and timber while enhancing agricultural productivity; (4) establish and conduct an educational program to train professionals in the techniques of farm forestry; (5) establish units within the Provincial Forest Departments to conduct farm forestry assistance programs; and, (6) institute an operational program to demonstrate the social, economic, and technical viability of farm and energy forest systems.

B. Project Components

The project will consist of three closely-related components: (1) manpower training and institutional development in forestry policy, forestry planning, and the design and implementation of on-farm tree crop management programs; (2) a program of research to identify and evaluate on-farm tree crop management strategies that are technically feasible and economically and socially viable; and, (3) a series of operational projects to institutionalize the policies, skills, and lessons provided through manpower development and research activities and to demonstrate the operational viability of alternative strategies to encourage farmers to establish tree crops as a supplemental activity on their farm and range lands.

The manpower training and institutional development component has three primary purposes. First, it is intended to strengthen the capability of the Forestry Departments at both the federal and provincial levels to collect and analyze data on forest resources, the current and future demand for fuelwood and other forest products, and the viability of alternative forestry programs on public and private lands. The second purpose is to strengthen the capability of the Pakistan Forest Institute, working with related agricultural institutions, to provide training in and conduct research on the social, economic, and technical aspects of farm and energy forestry programs. The third purpose is to develop the institutions and train the staff who will encourage and assist private landowners in adopting farm and energy forestry practices on their farm and range lands.

Technical assistance, training and commodities will be provided to the Office of the Inspector General of Forests within the Ministry of Food, Agriculture, and Cooperatives to strengthen a federal forest policy and planning team. This team will assume overall responsibility for working with the provinces to conduct systematic analyses for the development of a coherent federal forestry and fuelwood development plan. Similar assistance will be provided to each of the Provincial Forest Departments to assist them in collecting data and conducting analyses that will lead to the preparation of provincial forestry and fuelwood development plans that contribute to and are consistent with the overall federal plan. In all cases, these analyses and plans will be prepared in a manner such that they support the GOP's annual, five-year, and long-term planning cycles and provide the information required for investment planning and manpower development in the forestry sector. Under the manpower and institutional development component, technical assistance and training will also be provided in support of the research and operational components described below.

The research component has two purposes. First, this component will result in the design and evaluation of alternative farm forestry strategies intended to produce fuelwood, fodder and timber from trees while enhancing the productivity of conventional agricultural crops. Second, the research component will address more fundamental issues whose clarification could contribute to farm forestry productivity and to forest productivity in general. The research program will be centered at the Pakistan Forest Institute and supplemented by activities conducted by the Provincial Forest Departments. The topics to be addressed will include the economics of managing trees on farm and range lands; the social and anthropological factors affecting the adoption of farm forestry practices; the design and yield of farm forestry systems to meet varying needs on alternative sites; species trials and provenance tests; seed

improvement; ecological studies, and hydrological studies. In addition to training and technical assistance, commodities and operational support will be provided to strengthen the research effort.

The primary purpose of the farm and energy forestry field operational component of the project is to demonstrate the economic, technical, and social feasibility of producing tree crops on privately-owned farm and range lands. Supplemental purposes include providing on-the-job training in farm forestry techniques for foresters, nursery staffs, and farmers; improving fuelwood supplies in project locales; contributing to farm productivity in some of the poorer agricultural regions of Pakistan; and, increasing the availability of mine timbers for coal mine development.

Three general areas have been selected for operational activities. These include the barani (rainfed) areas of the Punjab and NWFP, the irrigated farmlands of Nasirabad, Baluchistan, and the forest plantations in Sind. These areas were selected for a variety of reasons including the relative scarcity of fuelwood, the demonstrated interest of the farmers and the Forest Departments in these areas, and the availability of land and water for tree crop management.

Although the approach taken will differ somewhat from area to area, the activities will follow a similar pattern. Years 1 and 2 will be comprised of detailed technical, economic, and social designs of the strategies likely to work in each region. During this period, the staff who will be responsible for managing the activities will be designated and provided training as appropriate; farmer advisory groups will be established to help guide the project's design and implementation; designation of the initial planting sites will be made; and, the private sector will be assisted in organizing the nurseries necessary to provide seedlings during years 3 and 4 of the project. Years 3 and 4 will see the initial planting of seedlings on the project sites. An evaluation conducted at the end of year 4 will play a substantial role in shaping the strategy for the final 4 years of the project. At this time, it is anticipated that tree planting will be substantially increased by using the strategies that have proven most successful during the early stages of the project in locales where farmers show the greatest interest.

C. Implementation Plan

1. Illustrative Implementation Schedule

All project activities are scheduled to take place over an eight year period beginning in October 1983 and ending in September 1991. As soon as possible after the Project

Agreement has been signed and the necessary conditions precedent have been met, the Mission, with the concurrence of the GOP, will:

a. negotiate and award a contract to a U.S. firm for General Technical Assistance Services (GTAS) required for all of the project components;

b. procure household and office furniture for the initial long-term technical assistants; and,

c. procure project vehicles.

After the arrival of the expatriate Senior Technical Advisor/ Chief of Party (COP) and the first group of technical assistants, the following five activities will be initiated and should be substantially completed in the first project year;

a. the preliminary training plan, including identification of suitable candidates, and enrollment of the initial group in suitable programs;

b. the socio-cultural baseline assessment of the target areas in the operational component;

c. the initial farm forestry orientation short courses for Federal and Provincial Forestry officials and field staff;

d. the creation of Federal and Provincial coordinating mechanisms and implementing organizations for farm and energy forestry; and,

e. the evaluation of forest management and silvicultural requirements in the Sind Forest Plantations.

In addition to these activities, a series of training subcomponents including short courses and study tours will be started that will continue throughout the project.

As the project moves into its initial field operations in the second and third project years, new activities will be added while the training programs continue. Most importantly, farm forestry field staff will be developing the required facilities in their target areas including the construction of nurseries in primarily the private sector. Field staff will also be making contact with local farmers and residents. In parallel with these activities, farm and energy forestry research projects will have been designed and started. By the end of the third project year, it is expected that the PFI faculty and the technical assistants will be teaching the new Farm Forestry curriculum for B.Sc. and M.Sc. candidates. The first external evaluation is tentatively scheduled to occur at the

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end of the second project year to assess the results of the early activities and to suggest any necessary fine-tuning as the project moves into larger field operations.

The major new activity in the fourth and subsequent years of the project will be the development of federal and provincial plans for public and private forest resources. The O/IGF and provincial planning units will undertake this task with the assistance of long-term expatriate and local consultants. Also in this period, the scale of field operations is expected to increase substantially as adoption of farm forestry practices picks up.

2. A.I.D. Responsibilities

A.I.D. will be responsible for: (a) contracting with all expatriate technical consultants, and, in specified cases, Pakistani consultants; (b) purchasing directly all project vehicles, all household and office equipment and supplies for long-term consultants, as well as arranging for the procurement of the remaining off-shore commodities; (c) arranging for long-term and short-term training of Pakistanis outside of Pakistan; (d) providing sufficient staff to participate in the scheduled project evaluations and liaise with host country staff in the implementation of this project; and, (e) inspecting and certifying for payment construction installations.

3. GOP Responsibilities

The major GOP implementing agency for the project will be the Office of the Inspector General of Forests (O/IGF) within the Ministry of Food, Agriculture and Cooperatives. A full-time Project Director shall be appointed within the O/IGF to be in charge of the overall project. This individual will also serve as the Additional Inspector General of Forests for Farm and Energy Forestry which will be established under this project. The AIGF/FEF will be responsible for coordinating the implementation of the research, training, and operational aspects of the farm and energy forestry program. The Deputy Inspector General of Forests for Policy, Planning, and Coordination will be responsible for implementing the federal forest planning component of the project and for coordinating the related provincial planning efforts. The Director General of the Pakistan Forest Institute will be responsible for implementing the curriculum development and research subcomponents of the project. At the provincial level, the Forest Departments will be the executing agencies and the Chief Conservator of Forests or his designee will serve as the Project Director within the province. The Conservator of Forests for Farm and Energy Forestry (or some similar position) will be responsible for implementing the Provincial forest planning subcomponents.

To provide effective overall leadership, establish policy and program guidelines, review and solve major project implementation problems, and serve as a continuing forum for all relevant Pakistani ministries and agencies to monitor project progress, a high level Federal Advisory Committee will be established. The Committee will most likely be chaired by the Ministry of Food, Agriculture and Cooperatives acting through the Office of the Inspector General of Forests. Membership shall include representatives from the energy and agriculture sections of the Ministry of Planning and Development, the National Energy Policy Committee, the Ministry of Finance, and at least one additional representative from the Ministry of Food, Agriculture and Cooperatives, who represents agricultural interests, as well as representatives from the four Provinces. Similar high level committees will be established within each of the Provinces.

In addition to the above staffing and organizational requirements, the GOP shall be responsible for: (a) ensuring that qualified and appropriate candidates are nominated and processed in a timely and efficient manner for all training activities under this project; (b) providing office space and facilities near their respective counterparts for all long-term advisors under this project; (c) purchasing local equipment and commodities as required under the project; (d) providing funds to cover the international travel costs of all participants attending training programs outside of Pakistan of more than one year in duration; (e) providing adequate staff to work with expatriate advisors and to participate in project evaluations; (f) providing sufficient operating expense funds to enable the respective GOP and other host country entities to carry out their responsibilities under this project; (g) providing sufficient funds to cover the recurrent costs of project components including the curriculum and research programs established within the Pakistan Forest Institute, the farm and energy forestry field operations, and the Federal and Provincial forest development planning process; and, (h) providing A.I.D. with timely approvals of reports, commodity purchases, training programs, expatriate contract personnel, and construction installations, as may be required from time to time during the life of the project.

ILLUSTRATIVE

SUMMARY OF PROJECT COSTS BY EXPENSE CATEGORY AND SOURCE OF FUNDING

(In $000s)

Expense Category	FY 1983		Life of Project Funding b/	
	A.I.D. Grant	GOP a/	A.I.D. Grant c/	GOP
1. Technical Assistance	4,327	-	9,243	-
2. Training	659	-	3,288	588
3. Commodities	1,005	-	1,621	178
4. Other Costs	566	190	8,690	12,503
5. Evaluation	-	-	374	-
Sub-Total	6,557	190	23,216	13,269
Contingency	443	15	1,784	1,031
TOTAL	7,000	205	25,000	14,300

a/ Expressed in dollar equivalents at the exchange rate of U.S. $1.00 = Rs 12.83

b/ Subject to the availability of funds to A.I.D. for this purpose and to the mutual agreement of both parties to proceed at the time of each subsequent increment.

c/ Does not include approximately $5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of utility vehicles, earthmoving and land levelling machinery, nursery equipment and research equipment, subject to the availability of funds to A.I.D. for this purpose.

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FINANCIAL PLAN ANNEX

A. Methodology and Assumptions

Cost estimates have closely paralleled the guidelines laid out in the USAID/Pakistan memo of 2/21/83 on "Preparation of Project Financial Plans and Budgets". These guidelines pertain to estimating the costs of technical assistance and training. They also provide a basis for assumptions regarding inflation and vehicle procurement, operating, and maintenance costs. The cost of procuring Pakistani consultants is estimated using an annual salary of $30,000 with the per diem, travel and office allowances laid out in the 2/21/83 memo. All commodities required for technical assistance including household and office support are included in the line item for project commodities.

Table K-1 presents a summary of all project costs by expense category and source of funding. Tables K-2 and K-3 present a summary of anticipated expenditures of the A.I.D. grant by fiscal year, foreign exchange and local costs, expense category and project component; and anticipated GOP expenditures by project component, expense category, and fiscal year, respectively.

The costs of specific operational items including nursery and tree planting, labor, soil conservation, plantation management, incremental GOP staff, and research were developed in discussions between GOP officials and the project design team. These costs are summarized in this annex,and detailed information to support these estimates is available in technical reports on file with ASIA/TR/EFE and USAID/Pakistan.

B. Field Operations

Tables K-4, K-5, and K-6 present cost information on the sub-components of field operations in the Barani, Nasirabad, and Sind. The "Total" lines in these Tables correspond to the sub-components of the "Other Costs" categories in Tables K-2 and K-3.

Staff costs have been compiled by using the mid point of the GOP salary scale for each grade (1983 scales) and adding to it allowances (at current rates) to cover rent, conveyance, and compensation. An inflation factor of 15% compounded annually. has been applied to these salaries and allowances. Applying these rates to the numbers of staff shown in Tables K-7 and K-8 and adding in an element for non-technical support staff as shown in the last item of the tables, yields the staff cost estimates. No incremental staff are envisioned for the Sind operations.

Office and administrative expenses were estimated on the basis of an average cost of Rs 6,000 (1983 costs) per professional office per annum; 20% compounded annually, has been added to cover inflation. Office rental/maintenance is provided for by applying a 5% charge on the capital cost of constructing field office space.

Vehicle operating and maintenance costs are estimated on the basis of 34 vehicles at $7,000 annually (in 1983 dollars) escalated at 15% annually. Heavy equipment operating and maintenance costs are estimated to be $17,300 annually for bulldozers and tractors, respectively. These costs are escalated at 15% annually.

TABLE K-1

SUMMARY OF PROJECT COSTS
BY EXPENSE CATEGORY AND SOURCE OF FUNDING
(in $ 000)

Expense Category [a]	Life of Project Funding				
	A.I.D. Grant [b]			GOP [c]	Grand Total
	FX	LC [c]	Total [d]		
Technical Assistance					
Expatriate Long-Term	6157	2295	8452	-	8452
Expatriate Short-Term	431	140	571	-	571
Local	-	220	220	-	220
Sub-total	6588	2655	9243		9243
Training					
Overseas Long-Term	1511	-	1511	358	1869
Overseas Short-Term	370	269	639	-	639
In-Country	-	1138	1138	230	1368
Sub-total	1881	1407	3288	588	3876
Commodities Sub-total	468	1153	1621	178	1799
Other Costs					
Evaluation	206	168	374	-	374
Operating Expenses	-	8690	8690	12503	19292
Sub-total	206	8858	9064	12503	21567
TOTAL	9143	14073	23216	13269	36485
Contingency	703	1081	1784	1031	2815
GRAND TOTAL	9846	15154	25000	14300	39300

a) Inflation = 10% on FX Salaries; 15% on all other FX Costs, local salaries and vehicle operating and maintenance costs; and 20% on all other local costs.

b) Does not include a $5.0 million loan for commodities procured under the Agricultural Commodities and Equipment Program (391-0468).

c) Expressed as dollar equivalents at the exchange rate of US$1.00 = Rs 12.83

d) Project Costs are defined as anticipated earmarkings or commitments of funding through, for example, PIOs, contracts, purchase orders, or PILs.

TABLE K-2

SUMMARY OF PROJECT EXPENDITURES BY PROJECT COMPONENT, EXPENSE CATEGORY, AND FISCAL YEAR FOR A.I.D. GRANT FUNDS

(in $000)

	1984		1985		1986		1987		1988		1989		1990		1991		TOTAL	
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC
Institutional and Manpower Development																		
Technical Assistance																		
Long-Term U.S.	275	96	456	104	562	185	675	254	683	272	667	217	545	254	132	129	3995	1511
Short-Term U.S.	174	40	-	-	-	-	-	-	51	16	54	21	-	-	67	29	346	106
Local	-	45	-	64	-	18	-	22	-	-	-	30	-	-	-	41	-	220
Sub-total	449	181	456	168	562	203	675	276	734	288	721	268	545	254	199	199	4341	1837
Training																		
Long-Term	-	-	178	-	358	11	311	27	193	30	67	35	-	40	-	46	1107	189
Short-Term	77	58	102	79	44	71	50	74	97	118	-	85	-	49	-	114	370	648
Sub-total	77	58	280	79	402	82	361	101	290	148	67	120	-	89	-	160	1477	837
Commodities	213	73	-	6	60	101	35	65	40	78	-	12	-	15	-	18	348	368
Other Costs	-	217	-	27	-	33	-	36	-	42	-	48	-	57	-	63	-	523
SUB-TOTAL	739	529	736	280	1024	419	1071	478	1064	556	788	448	545	415	199	440	6166	3565
Research																		
Technical Assistance																		
Long-Term	25	12	79	24	117	48	95	35	143	73	115	51	32	36	-	-	606	279
Short-Term	-	-	-	-	-	-	-	-	25	8	27	11	-	-	33	15	85	34
Sub-total	25	12	79	24	117	48	95	35	168	81	142	62	32	36	33	15	691	313
Training	-	-	-	-	-	-	134	-	154	-	78	-	38	-	-	-	404	-
Commodities	3	-	6	-	11	-	13	-	16	-	19	-	24	-	28	-	120	-
Other Costs	-	5	-	11	-	21	-	29	-	24	-	19	-	24	-	31	-	164
SUB-TOTAL	28	17	85	35	128	69	242	64	338	105	239	81	94	60	61	46	1215	477

TABLE K-2 (Continued)

SUMMARY OF PROJECT EXPENDITURES BY PROJECT COMPONENT, EXPENSE CATEGORY, AND FISCAL YEAR - FOR A.I.D. GRANT FUNDS

(in $000)

	1984		1985		1986		1987		1988		1989		1990		1991		TOTAL	
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC
Operations																		
Technical Assistance	-	-	-	-	358	122	362	80	398	128	438	175	-	-	-	-	1556	505
Training	-	-	-	11	-	94	-	58	-	136	-	78	-	90	-	103	-	570
Commodities	-	128	-	177	-	52	-	62	-	159	-	106	-	63	-	38	-	785
Other Costs																		
Barani	-	-	-	5	-	51	-	181	-	446	-	809	-	1631	-	2268	-	5391
Nasirabad	-	-	-	1	-	11	-	34	-	73	-	128	-	258	-	327	-	832
Sind	-	-	-	21	-	106	-	241	-	166	-	266	-	319	-	382	-	1501
Construction	-	279	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	279
Sub-total		279		27		168		456		685		1203		2208		2977		8003
SUB-TOTAL	-	407	-	215	358	436	362	656	398	1108	438	1562	-	2361	-	3118	1556	9863
Evaluation Technical Assistance	-	-	38	24	-	-	45	30	-	-	56	48	-	-	67	66	206	168
TOTAL	767	953	859	554	1510	924	1720	1228	1800	1769	1521	2139	639	2836	327	3670	9143	14073
Contingency	59	73	66	43	116	71	132	94	139	136	117	164	49	218	25	282	702	1081
GRAND TOTAL	826	1026	925	597	1626	995	1852	1322	1939	1905	1638	2303	688	3054	352	3952	9846	15154

Inflation = 10% of FX salaries; 15% of all other FX costs, local salaries and vehicle operating and maintenance costs; and 20% of all other local costs.

Does not include a $5.0 million loan for commodities procured under the Agricultural Commodities and Equipment Program (391-0468).

Expressed as dollar equivalents at the exchange rate of US $1.00 = Rs 12.83

TABLE K-3

SUMMARY OF PROJECT EXPENDITURES BY PROJECT COMPONENT, EXPENSE CATEGORY, AND FISCAL YEAR FOR GOP FUNDS (in $000)

	84	85	86	87	88	89	90	91	Total
Institutional and Manpower Development									
Training	-	49	103	103	77	53	49	56	490
Other Costs	23	27	32	44	76	96	113	132	543
SUB-TOTAL	23	76	135	147	153	149	162	188	1033
Research									
Training	-	-	-	44	29	18	7		98
Other Costs	22	80	120	154	187	227	263	305	1358
SUB-TOTAL	22	80	120	198	216	245	270	305	1456
Operations									
Commodities	-	-	-	-	-	-	64	114	178
Other Costs									
Barani	104	533	629	710	886	1052	1227	1399	6540
Nasirabad	27	127	148	168	217	248	289	330	1554
Sind	-	182	188	258	316	393	441	499	2277
Facility O&M	14	17	20	24	29	35	42	50	231
Sub-Total	145	859	985	1160	1448	1728	1999	2278	10602
SUB-TOTAL	145	859	985	1160	1448	1728	2063	2392	10780
TOTAL	190	1015	1240	1505	1817	2122	2495	2885	13269
Contingency	15	79	96	117	141	165	194	224	1031
GRAND TOTAL	205	1094	1336	1622	1958	2287	2689	3109	14300

TABLE K-4

COST OF BARANI OPERATIONS BY SOURCE OF FUNDS AND ACTIVITY

(000 $ equivalent)

	84		85		86		87		88		89		90		91		Total	
	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP
Direct Plantation Costs					40		159		392		726		1479		2081		4877	
Nursery Construction			5		7		8		20		32		22		-		94	
Soil Conservation					4		14		34		51		130		187		420	
Forest Department Staff		95		220		253		292		370		465		533		613		2841
Forest Department Office/Administration		9		22		25		30		54		65		75		93		373
Equipment and Vehicle Operation				291		351		388		462		522		619		693		3326
TOTAL		104	5	533	51	629	181	710	446	886	809	1052	1631	1227	2268	1399	5391	6540

Note: No commodity purchase costs are included here.

TABLE K-5

COST OF NASIRABAD OPERATIONS BY SOURCE OF FUNDS AND ACTIVITY

(000 $ equivalent)

	84		85		86		87		88		89		90		91		Total	
	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOF	AID	GOP	AID	GOP	AID	GOP
Direct Plantation Costs					10		32		70		120		258		327		817	
Nursery Construction			1		1		2		3		8						15	
Forest Department Staff		25		58		66		77		105		121		139		160		751
Forest Department Office/Administration		2		6		6		7		12		14		16		20		83
Equipment & Vehicle Operation				63		76		84		100		113		134		150		720
TOTAL		27	1	127	11	148	34	168	73	217	128	248	258	289	327	330	832	1554

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TABLE K-6

COST OF SIND OPERATIONS BY SOURCE OF FUNDS AND ACTIVITY
(000 $ equivalent)

	84		85		86		87		88		89		90		91		Total	
	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP	AID	GOP
Plantation Improvement	-	-	21	126	68	90	103	170	-	199	-	243	-	238	-	247	192	1313
Plantation Conversion	-	-	-	-	38	3	92	11	111	19	133	32	160	48	191	65	725	178
Plantation Expansion	-	-	-	-	-	-	46	3	55	9	133	18	159	38	191	53	584	121
Equipment O&M	-	-	-	56	-	95	-	74	-	89	-	100	-	117	-	134	-	665
TOTAL	-	-	21	182	106	188	241	258	166	316	266	393	319	441	382	499	1501	2277

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TABLE K-7

ORGANIZATION AND STAFF IN BARANI OPERATIONS

Title	Grade	1984		1988 a/		Total	
		N	P	N	P	N	P b/
Provincial Project Headquarters							
Director General, Farm Forestry	19	1	1	-		1	1
Monitoring and Evaluation Officer	18	1	1	-		1	1
SPS Officer	18	1	1	-		1	1
Outreach Materials Officer	18	1	1	-		1	1
District Headquarters							
District Farm Forestry Officers	18	1	4	-		1	4
Sub DFFO's	17	1	4	-		1	4
Field Staff							
Farm Forestry Coordinators	16	3	11	2	6	5	17
Farm Forestry Nursery Operators	11	3	11	2	6	5	17
Farm Foresters	8	3	11	2	6	5	17
Clerical, Driving and other support staff							
To be provided at a total cost of 95% of emoluments of Provincial and District HQ staff							

a/ "Additional" staff who will be in place

b/ N = NWFP

P = Punjab

TABLE K-8

ORGANIZATION AND STAFF IN NASIRABAD

Title	Grade	1984	1988 a/	Total
Provincial Project Headquarter				
Director General, Farm Forestry	19	1	-	1
Monitoring and evaluation officer	18	1	-	1
Outreach Materials either Officer	18	1	-	1
District Headquarters				
District farm forestry officer	18	1	-	1
S-DDFO	17	1	-	1
Field Staff				
Farm Forestry Coordinator	16	3	2	5
Farm Forestry Nursery Operator	11	3	2	5
Farm Forester	8	3	2	5
Clerical, Driving and other Support Staff				
- allow 95% of emoluments of Provincial and District Staff				

a/ "Additional" staff who will be in place

Illustrative Equipment List

I. FP&D Project Financed

A. Education/Information

Photocopying machine (6)

PMT offset plate camera (1)

Photo reduction stand with camera (1)

Darkroom & printing equipment (1)

Paper cutting machine (1)

Offset press (1)

Stitching and binding equipment (1)

Electronic typewriter w/margin justification and proportional spacing (IBM or Xerox) (1)

Collating equipment

Airconditioning for process laboratory

Micro film and fiche readers (2 each)

Micro fiche camera & developing equipment

16mm movie projector w/sound (4)

16mm cameras & sound recording equipment (2)

Slide projector (10)

35mm cameras (5)

Screens & Misc. (15)

B. Office Furniture

Desks
Chairs
File Cabinets
Typewriters
Stools
Air Conditioning
Book Cases

(25 sets)

II. AC&E Program - Financed

A. Research & Analytical Equipment

Programmable calculators (100)

Micro computers (50)

Weighing rain gauge (9)

Anemometer w/recorder (4)

Thermohydrograph (8)

Pyranograph (4)

Sediment Sampler (6)

Bed load sampler (6)

Water level recorders (20)

Current meter (3)

Laboratory balance (6)

Soil sieves (3)

Green house (2)

pH meters (17)

Atomic Absorption Spectrophotometer (2)

Flame Photometer (2)

Microhjeldhal Apparatus (2)

Soil augers (7)

Lab reagents

Sample bottles & containers

Soil moisture & temperature meter (2)

Microscope

Dissecting Microscope

Visual Accumulation Tubes for particle size analysis w/accessories (2 sets)

B. Earthmoving & Land Clearing

Bulldozer (1)

Flatbed trailer w/cab (1)

Drum-chopper (1)

Backhoe (2)

Fuel truck (1)

Lubrication Truck (1)

Tractor (4)

Disc plough (4)

Disc Harrow (4)

Scraper (4)

Root rake (1)

Stump Extracter (1)

Chain Saw (25)

C. Nursery

Seed storage and cabinets w/ and w/o temperature control (17)

Hand tools (shovels, hoes, picks etc.) (500)

Wheel barrows (100)

Well drilling equipment (2)

Seed balances (10)

Tractors (medium) (17)

Mouldboard plow / offset disc harrow (17)

Sectional ladders w/safety belts (10)

Pole Pruners (20)

Seed Tumbler (1)

Seed Dewinger (1)

Seed Blower (17)

Cleaning/Garding Vibrating Table (17)

Cold storage chambers (1)

D. Surveying

Dumpy level (5)

Clinometer (12)

Steel Tapes (12)

Stadia Rods (10)

Transit (5)

Compasses (10)

Tripods (10)

Drafting Equipment (1)

E. Watering

Tank Trucks (6)

Submercible electric pumps (25)

Hand pumps (25)

F. Transport & Vehicles

4-wheel drive pickup trucks (26)

4-wheel drive utility vehicles (8)

INITIAL ENVIRONMENTAL EXAMINATION (IEE)

PROJECT LOCATION	: Pakistan
PROJECT TITLE	: Forestry Planning and Development
LIFE OF PROJECT	: FY 1984 - FY 1990
FUNDING	: $25 million ESF Grant and $18.5 million GOP Contribution
IEE PREPARED BY	: Charles E. Hewett, Consultant, Office of Energy and Engineering USAID/Pakistan
ENVIRONMENTAL ACTION RECOMMENDED	: No further Environmental Analysis is required.
MISSION DIRECTOR'S CONCURRENCE	: Signature _____
	Date _____
DECISION OF ENVIRONMENTAL OFFICER, BUREAU FOR ASIA	: Approved _____
	Disapproved _____
	Date _____

A. PROJECT DESCRIPTION

This project will assist the Government of Pakistan (GOP) and Provincial Forestry Departments to formulate and implement plans to assess, develop, and use Pakistan's potential forest resources.

1. Institutional and Manpower Development

This component will provide training and technical assistance in: forest economics and financial analysis; forest sociology and social forestry design; selection and management of improved tree species; yield analysis and comparative evaluations for matching species with soil and site characteristics; and market assessments and project feasibility analysis.

2. Farm and Range Land Afforestation on Private Lands in the Rainfed (Barani) Areas of the Punjab and NWFP

This project component will provide technical assistance, training, commodities and operational support for the Forest Departments of the Punjab and NWFP to establish nurseries and outreach programs encouraging farmers to produce tree crops on marginal farm and range lands.

3. Farm Afforestation on Private, Irrigated Lands in Nasirabad, Baluchistan

This project component will provide technical assistance, training, commodities, and operational support for the Forest Department of Baluchistan to establish tree nurseries and outreach programs encouraging private farmers to produce trees as supplemental crops enhancing agricultural productivity on irrigated farmland in Nasirabad District.

4. Improved and Expanded Management of Provincial Forest Plantations in the Sind

This project component will provide technical assistance, training, earth-moving equipment, seed storage facilities, and operational support for the improved and expanded management of provincial forest plantations in the Sind.

5. Forestry Research

This component will provide technical and financial assistance for research to systematically assess alternative strategies to enhance agricultural productivity while growing trees on farm and range lands.

B. EVALUATION OF ENVIRONMENTAL IMPACT

The project components dealing with institutional and manpower development and forestry research will, by their nature, have little or no impact on the environment. According to A.I.D.'s environmental procedures, the institutional and manpower development component and the economic and sociological aspects of the research component are categorically excluded from requirements for an Initial Environmental Examination, Environmental Assessment or Environmental Impact Statement since they are studies only. Research components examining the production and yield of farm forestry crops will largely be evaluations of on-going activities, and as such, will have little or no additional impact on the environment.

Afforestation operational activities that look promising include the planting of trees on deteriorated, private farm and range lands in the rainfed areas of the northern Punjab and southern NWFP, on irrigated plantations as shelterbelts and windbreaks in Nasirabad, Baluchistan, and on provincial forest plantations in the Sind. These activities will be demonstration and pilot projects and will, themselves, have limited impact on the natural environment. It is the purpose of these activities, however, to demonstrate techniques for improving land management that will, when applied more broadly, substantially improve the quality of the human and natural environments. These programs will stabilize and improve soil quality, reduce the rate of siltation of critical watersheds, increase the production of products needed to sustain and enhance rural economies, and increase the production of agricultural crops while reducing the application of chemical fertilizers and soil losses from erosion. Because of the limited scale of the operational activities and their potential to enhance the quality of the natural and human environments, it is therefore recommended that no further environmental analysis be required.

C. RECOMMENDATION

In view of the above examination of the environmental impacts of this project, it is recommended that a negative determination be made.

LIST OF CONSULTANT REPORTS ON FILE AT USAID/PAKISTAN

1. Report on Forest Plantation Irrigation and Riverine Forests, USAID Forestry Planning and Development Project, by Paul H. Kirshen, June, 1983.

2. Report on Forest and Agricultural Ecological and Silvicultural Aspects, USAID Forestry Planning and Development Project, by F. B. Armitage, June, 1983.

3. Report on Training Needs for Farm Forestry in Pakistan, USAID Forestry Planning and Development Project, by Christopher Gibbs, May, 1983.

4. Report on the Hydrological Aspects of Forest Development in the Barani, USAID Forestry Planning and Development Project, by Paul Duffy, May, 1983.

5. Report on the Economic Aspects of Farm and Energy Forestry in Pakistan, USAID Forestry Planning and Development Project, by Henry Kernan, June, 1983.

TRAINING PLAN

Project Activity and Intended Audience	Type of Training	Length	Place	Number of Participants
I. O/IGF and Related Ministries				
A. Policy Planning and Management				
1. Policy, Planning and Administration Skills for Professional Staff in the O/IGF	Masters Degree	21 months	US	2
2. Management Training for O/IGF Staff	Short Course	3 months	US or Third Country	4
3. Monitoring and Evaluation Techniques for O/IGF Staff	Short Course	3 months	US or Third Country	2
4. Supplementary Planning and Management Training for O/IGF Staff	Short Course	1 month	Pakistan	4
B. Farm and Energy Forestry				
1. Farm Forestry for Staff of the DIGF for Farm and Energy Forestry	Masters Degree	21 months	US	1
2. Farm and Energy Forestry Orientation Course for O/IGF and Related Ministries	Short Course	1 month	Pakistan	12
3. Asian Farm Forestry Tour for Senior O/IGF Staff and Staff of Related Ministries	Study Tour	2 weeks	South Asia	14

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TRAINING PLAN

Project Activity and Intended Audience	Type of Training	Length	Place	Number of Participants
II. Provincial Forest Departments				
A. Planning and Management				
1. Planning and Administration Skills for Professional Planning Staff in the Office of the Chief Conservator	Masters Degree	21 months	US	4
2. Management Training for Staff in Chief Conservator's Office	Short Course	3 months	US	8
3. Monitoring and Evaluation Techniques for Planning Staff in Chief Conservator's Office	Short Course	3 months	US or Third Country	8
4. Supplementary Planning and Management Training for Provincial Forest Department Staff	Short Course	1 month	Pakistan	32
B. Farm and Energy Forestry				
1. Farm Forestry; for Administrative and Senior Field Staff in the Provincial Farm Forestry Organizations	Masters Degree	21 months	US	7

TRAINING PLAN

Project Activity and Intended Audience	Type of Training	Length	Place	Number of Participants
2. Resource Economics; for Forest Planning Staff in Chief Conservators' Office	Masters Degree	21 months	US	2
3. Irrigation/Hydrology for Operations Staff in Sind Forest Department	Masters Degree	21 months	US	1
4. Farm and Energy Forestry Orientation for Provincial Administrative and Field Staff	Short Course	1 month	Pakistan	64
5. Asian Farm Forestry Tour for Senior Administrative and Field Staff in the Provincial Farm Forestry Organizations	Study Tour	2 weeks	South Asia	10
6. Annual Pakistan Farm Forestry Tour for Farm Forestry Staff	Study Tour	2 weeks	Pakistan	192
7. Field Training for Farmers	Field Days and Short Courses	Variable	Pakistan	57,500 days
8. Asian Farm Forestry Tour for Farmers	Study Tour	2 weeks	South Asia	40

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TRAINING PLAN

Project Activity and Intended Audience	Type of Training	Length	Place	Number of Participants
C. Provincial Research				
Farm and Energy Forestry for Research Staff of Gatwal, Punjab and Miani, Sind	Masters Degree	21 months	US	4
III. Pakistan Forest Institute				
A. Education				
1. Farm Forestry Outreach Techniques and Program Design; for Future PFI Faculty	Masters Degree	21 months	US	1
2. Farm Forestry Systems, Biological Emphasis; for Future PFI Faculty	Masters Degree	21 months	US	1
3. Planning and Resource Economics; for Future PFI Faculty	Masters Degree	21 months	US	1
4. Revised BSc/MSc Program at the PFI Ancorporating Farm Forestry Curriculum for Future Administrators and Field Staff of Farm Forestry Program	BSc/MSc	24 months	Pakistan	78

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TRAINING PLAN

Project Activity and Intended Audience	Type of Training	Length	Place	Number of Participants
B. Research				
1. Silvics/Tree Improvement; for Future PFI Faculty and Research Staff	Masters Degree	21 months	US or Third Country	1
2. Forest Ecology for Future PFI Faculty and Research Staff	Masters Degree	21 months	US	1
3. Asian Farm Forestry Tour; for PFI Research Staff and Faculty	Study Tour	2 weeks	South Asia	16

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AIDAC

FOR ASIA/PD - VAN RAALTE AND MATHESON

E.O.12356 N/A
SUBJECT: FORESTRY PLANNING AND DEVELOPMENT PROJECT
(391-0481)

REFERENCE: STATE 210964

1. BASIS FOR CONSTRUCTION ESTIMATES IS AS FOLLOWS:

(A) FIELD OFFICES AND WAREHOUSES AT DISTRICT AND TEHSIL LEVELS

- (I) DISTRICT LEVEL:

FUNCTIONAL SPACE	-	COVERED AREA (SQ. FT.)
DFFO'S OFFICE (14' X 14')	-	196
ASST. FFO OFFICE (12' X 12')	-	144
SECRETARY AND CLERK (14' X 12')	-	168
STORES ROOM (10' X 10')	-	100
BATHROOM (8' X 6')	-	48
KITCHENETTE (8' X 6')	-	48
GARAGE AND WORKSHOP (12' X 10')	-	120
- TOTAL COVERED AREA EQUALS	-	824
ADD 20 PERCENT FOR HALLWAYS ETC. EQUALS		165
- GRAND TOTAL EQUALS	-	989 OR
- -	-	1000 SQ.FT.

ESTIMATED CONSTRUCTION COST AT RS 180/SQ. FT. EQUALS
1000 X 180 EQUALS RS 180,000 PER UNIT.
COST OF SIX UNITS AT RS 180,000 EACH EQUALS RS 1,080,000.

- (II) TEHSIL LEVEL:

FUNCTIONAL SPACE	-	COVERED AREA (SQ. FT.)
OFFICE FOR ONE SENIOR OFFICER (12' X 12')		144
OFFICE FOR TWO JUNIOR OFFICERS (14' X 12')		168
STORES ROOM (10' X 10')		100
BATHROOM (8' X 6')	-	48
GARAGE FOR TWO VEHICLES (14' X 12')		168
- TOTAL EQUALS	-	628 OR
- -	-	630 SQ.FT.

ESTIMATED CONSTRUCTION COST AT RS 150/SQ.FT. EQUALS
630 X RS 150 EQUALS RS 94,500.

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GARAGE FOR TRACTOR, TOOL SHED, AND WORKSHOP EQUALS
300 SQ.FT. ESTIMATED CONSTRUCTION COST AT RS 100/SQ.FT.
EQUALS 300 X RS 100 EQUALS RS 30,000.

TOTAL ESTIMATED CONSTRUCTION COST EQUALS 94,500 PLUS
RS 30,000 EQUALS RS 124,500 PER UNIT.

COST OF SEVENTEEN UNITS AT RS 124,500 EACH EQUALS		RS 2,116,500
TOTAL CONSTRUCTION COST EQUALS		RS 3,196,500
OR	-	DOLS 249,726
CONTINGENCY EQUALS	-	DOLS 29,274
TOTAL EQUALS	-	DOLS 279,000

NOTE: 4000 SQ.FT. PER SITE SHOWN ON PAGE 165 OF PP SHOULD HAVE READ 1,000 SQ.FT. PLEASE CORRECT.
(B) CONSTRUCTION OF HOSTEL AT PAKISTAN FOREST INSTITUTE, PESHAWAR

FUNCTIONAL SPACE	-	-	COVERED AREA (SQ. FT.)
24 STUDENTS AT 224 SQ.FT. PER STUDENT			5376
LOUNGE	-	-	630
BATHROOMS	-	-	1007
STORAGE AREA	-	-	400
ELECTRICAL ROOM		-	100

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FOR ASIA/PD - VAN RAALTE AND MATHESON

E.O.12356 N/A
SUBJECT: FORESTRY PLANNING AND DEVELOPMENT PROJECT

SERVANTS SPACE - 200

- TOTAL EQUALS - 7813
- PLUS 40 PERCENT EQUALS TOTAL COVERED AREA OF 10,939
- SQ. FT.

CONSTRUCTION COST AT RS 240/SQ.FT. EQUALS 10,939 X 240 EQUALS RS 2,625,360 OR DOLS 205,106. THE DOLLAR AMOUNT IS INCLUDED UNDER LINE ITEM QUOTE OTHER COSTS UNQUOTE ON PAGE 4 OF ANNEX K-2 OF THE PP.

(C) NURSERIES OF 50,000 PLANT CAPACITY

- (I) BARANI AREA: 164 NURSERIES AT DOLS 573 EACH EQUALS APPROX. DOLS 94,000.

- (II) NASIRABAD AREA: 27 NURSERIES AT DOLS 556 EACH EQUALS APPROX. DOLS 15,000.

NOTE: UNIT COST INCLUDES LAND LEVELLING, DITCH DIGGING, FENCES AND SHED CONSTRUCTION.

(D) SOIL CONSERVATION: FARMS IN THE RAINFED AREAS HAVE BEEN CLASSIFIED INTO SEVEN CATEGORIES AS DESCRIBED IN PAUL DUFFY'S CONSULTANT REPORT (WHICH IS INCLUDED AS AN ANNEX IN F.B. ARMITAGE'S CONSULTANT TECHNICAL REPORT). THE FOLLOWING ACREAGE AND COST SUMMARY IS TAKEN FROM PAGES 83 AND 84 OF ARMITAGE'S REPORT:

FARM TYPE	COST RS/ACRE	ACREAGE TO BE TREATED	TOTAL COST RS
I	270	3260	880,200
II	280	1640	459,200
III & IV	600	1010	606,000
V, VI, VII	170	640	108,800
-	-	6550	RS 2,054,200 IN
-	-	-	1983 DOLLARS

APPLYING AN INFLATION FACTOR OF 15 PERCENT COMPOUNDED ANNUALLY AND BASED ON PROJECTED CONSTRUCTION IN 1986 THROUGH 1991, THIS AMOUNTS TO APPROX. RS 5,400,000 OR ABOUT DOLS 420,000 (SEE PAGE 7 OF ANNEX K) WHICH TRANSLATES INTO A UNIT COST PER ACRE OF ABOUT DOLS 64 (I.E. DOLS 420,000 DIVIDED BY 6,550 ACRES).

NOTE: LABOR IS THE PRIMARY COST IN MOST OF THE PLANNED

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SOIL CONSERVATION ACTIVITIES SINCE FEW COMMODITIES ARE NEEDED.

(E) LAND LEVELLING:

REFER TO ANNEX K-6 OF PP: COST OF SIND OPERATION (AID ONLY)

- (I) PLANTATION IMPROVEMENT FOR 1810 ACRES EQUALS DOLS 192,000

- (II) PLANTATION CONVERSION FOR 550 ACRES EQUALS DOLS 725,000

- (III) PLANTATION EXPANSION FOR 400 ACRES EQUALS DOLS 584,000

- TOTAL COST EQUALS DOLS 1,501,000

NOTE: (I) AND (II) ABOVE INCLUDE COSTS OF LAND LEVELLING CANAL REHABILITATION AND RE-SEEDING. ITEM (III) IS FOR NEW CANAL CONSTRUCTION.
2. PER PARA TWO OF REFTEL, FEDERAL AND PROVINCIAL FORESTRY DEPARTMENTS AND THE PAKISTAN FOREST INSTITUTE ARE THE ENTITIES WHICH WILL RECEIVE PROJECT-FINANCED EQUIPMENT. MISSION HAS THOROUGHLY EXAMINED THE CAPABILITIES OF THESE INSTITUTIONS TO ADEQUATELY WAREHOUSE, OPERATE AND MAINTAIN THIS EQUIPMENT AND TO MAINTAIN THE FIELD OFFICES, WAREHOUSES AND HOSTEL TO BE CONSTRUCTED WITH PROJECT FUNDS. MISSION IS SATISFIED THAT BOTH THE ABILITY AND THE COMMITMENT EXIST ON THE PART OF THE GOP TO ENSURE THAT A.I.D. FINANCED EQUIPMENT WILL BE ADEQUATELY OPERATED, WAREHOUSED AND MAINTAINED AND THAT FACILITIES CONSTRUCTED WITH PROJECT FUNDS WILL BE ADEQUATELY MAINTAINED. MISSION'S RECOGNITION OF THE IMPORTANCE OF THIS ISSUE

Department of State

INCOMING TELEGRAM

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AIDAC

FOR ASIA/PD - VAN RAALTE AND MATHESON

E.O. 12356 N/A
SUBJECT: FORESTRY PLANNING AND DEVELOPMENT PROJECT

IS REFLECTED IN THE INCLUSION OF A COVENANT TO THIS EFFECT, INVOLVING GOP PROGRESS REPORTS ON O&M TRAINING OF PERSONNEL (SEE PAGE 172 OF PP AND ANNEX H, PAGE 4 PARA 3) WHICH HAS BEEN AGREED TO BY THE GOP. IT SHOULD ALSO BE NOTED (SEE ANNEX K, PAGE 6) THAT THE GOP CONTRIBUTION INCLUDES ABOUT DOLS 230,000 FOR FACILITY O&M OVER THE LIFE OF THE PROJECT. IN ADDITION, THE FIELD OFFICES TO BE CONSTRUCTED UNDER THE PROJECT INCLUDE WAREHOUSING AND MAINTENANCE FACILITIES.

3. IF NECESSARY, FOR FURTHER COST INFORMATION AND DETAILS, PLEASE REFER TO INDIVIDUAL CONSULTANTS' REPORTS WHICH WERE SENT TO ASIA/TR/EFE AND S&T/FNR IN LATE JUNE, 1983. KING

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