

PD-ABL-242

95152

***REVIEW OF THE FORESTRY PLANNING &  
DEVELOPMENT PROJECT***

***GOVERNMENT OF PAKISTAN -- USAID***

**Final Report  
January 4, 1994**

Prepared by

Donald L. Grebner  
Forestry Research Analyst  
Winrock International

and

Charles R. Hatch  
Chief of Party  
Technical Assistance Team  
Winrock International

## TABLE OF CONTENTS

i.	<i>Table of Contents</i>	i
ii.	<i>Acknowledgments</i>	ii
iii.	<i>Executive Summary</i>	iii
I.	<i>Introduction</i>	1
II.	<i>Methodology</i>	2
III.	<i>Results</i>	4
	A. <i>General Information</i>	4
	B. <i>Initial and Present Expectations</i>	5
	C. <i>Establishment and Management of Tree Plantations</i>	7
	D. <i>Marketing of Harvested Wood Products</i>	8
	E. <i>Effect of Extension and Outreach Program</i>	11
	F. <i>Forestry Training at Pakistan Forest Institute</i>	13
	G. <i>Forestry Research</i>	14
	H. <i>Women in Forestry</i>	16
	I. <i>NGO Program</i>	17
IV.	<i>General Discussions and Conclusions</i>	18
	A. <i>Are Farmers Managing for Tree Quality?</i>	19
	B. <i>How are Wood Marketing Opportunities Affecting Farmer Choice</i>	20
	C. <i>Extension and Outreach Program</i>	22
	D. <i>Forestry Training at Pakistan Forest Institute</i>	23
	E. <i>Forestry Research at Pakistan Forest Institute</i>	24

<i>F.</i>	<i>Women in Forestry</i>	
<i>G.</i>	<i>Role of NGOs In Private Forestry Development</i>	26
<i>V.</i>	<i>Lessons Learned</i>	26
<i>VI.</i>	<i>References</i>	30
<i>VII.</i>	<i>Appendix A.</i>	
<i>A1.</i>	<i>Major Objective of Project</i>	
<i>A2.</i>	<i>A Life of Project Targets and Accomplishments</i>	
<i>A3.</i>	<i>Details of Grant Commitments</i>	
<i>A4.</i>	<i>Proforma for Evaluation of Private Tree Farms</i>	
<i>A5.</i>	<i>Proforma for Senior M.Sc. Students at Pakistan Forest Institute</i>	
<i>A6.</i>	<i>General Evaluation for Women in Forestry</i>	

## **ACKNOWLEDGMENT**

This study was successfully completed because of the cooperation of farmers, Forestry Planning and Development project (FP&D) staff, Punjab and NWFP Forest Department officials, faculty members from the Pakistan Forest Institute, USAID and Winrock International. Useful suggestions and comments provided by these people significantly increased the quality of this review.

Special thanks go to Mr. Tahir Wadood Malik, Office Manager cum Communications and Training Coordinator, Winrock International Technical Assistance Team for his extra effort in helping Don Grebner with the logistics of staying in Pakistan and numerous cultural insights. His help made Mr. Grebner's stay successful and enjoyable. Most of all special thanks to Mr. Raja Muhammad Omer, Sub-divisional Forest Officer, FP&D project for his invaluable help in the field and in the office. His commitment made this evaluation come off easier than anticipated. Our thanks to Dr. William Bentley, Senior Program Officer, Winrock International. His interest in continuing farm forestry as a viable rural development tool helped make this study possible.

## ***EXECUTIVE SUMMARY***

This study reviews the major elements of the Forestry Planning and Development (FP&D) project. Over 1983-1993, the elements include: initial and present expectations by farmers; the establishment and maintenance of private tree plantations on farmlands; marketing of harvested wood products; extension and outreach program; forestry research and training; women in development; and establishment of an NGO program. This review develops a series of lessons learned for each major element. In addition, this project is a case study useful in thinking about farm forestry activities in general that are sponsored by international development organizations.

The project has been successful in reforesting large areas of Pakistan, but problems persist. Farmers are not actively managing their plantations, resulting in reduced growth consequently affecting quantity and quality of yields. Inadequate training in silvicultural methods and lack of markets for thinned material are major constraints affecting the management of tree crops by farmers. More emphasis is essential in managing for wood quality, establishing species diversity, and developing the forest product industry.

Forestry research is maintaining a reasonable pace under heavy financial constraints. The linkages for exchanging information among researchers, extension foresters and farmers, however, need attention to make farm forestry sustainable on large scale and make research results more useful for the farmers.

The NGO Grant program may play a pivotal role in continuing the advancement of farm forestry after the termination of the FP&D project. NGOs which have recently initiated programs in forestry will reduce environmental degradation, maintain biodiversity, produce wood on farmlands and improve their capacity to strongly address forestry issues. The NGO program is gradually gaining momentum, but it is too early to assess its potential or successes at this stage.

The methodology used in this study is a mix of structured interviews and informal discussion. The samples are too small for rigorous inference, and the samples have some biases. Those limitations noted, the results seem robust and contain impressions held by Pakistani and external observers.

# ***I. INTRODUCTION***

## ***BACKGROUND***

Wood based resources are an important part of Pakistan's economy even though the country has only 4.26 million hectares under forest cover (PFI 1992). In some areas, one half of all fuel used for heating and cooking is wood with rural areas using over 80%. Private farmlands are producing nearly 90% of the fuelwood requirements as well as nearly half of the timber used by rural families (Winrock International 1991). Hence, trees on farmlands are a substantial income source for rural families.

Wood is an important raw material for sporting-goods, furniture manufacturing, particleboard industries, match making and coal mines. The yearly growth of wood fiber, however, is about 80% of the annual wood harvest (Winrock International 1991). Declining supplies and expanding demands assure ready marketability and good prices for most timber-based commodities. These conditions favored the initiation of the Forestry Planning and Development Project (FP&D) which aimed at filling the supply gap for domestic energy. It also developed and expanded the base for meeting the increased future requirements through public involvement and participation in tree plantation activity, particularly in wood deficit areas of the provinces. This activity supports sound organization of agroforestry research and training programs at the Pakistan Forest Institute (PFI).

## ***OBJECTIVES OF STUDY***

The primary objective of this study is to evaluate the "farmer response to tree planting opportunities provided by the FP&D project." The secondary objectives include:

- Are farmers managing trees for quality?
- How are wood marketing opportunities affecting farmers choices?
- How is the outreach program affecting the information exchange linkage between research, forestry officials and farmers?

Answers to these questions provides a preliminary review of some important components of the FP&D project.

## ***SCOPE OF STUDY***

This report explores several questions and uses their answers to develop lessons learned from the FP&D project.

- What are the initial and present expectations of the project by farmers?

- How do farmers raise tree plantations?
- How do farmers manage tree plantations?
- How do farmers market farm-produced wood?
- What are the effects of the extension and outreach program?
- How does the project train farmers, staff and recent graduates?
- What is the status of forestry research under the FP&D project?
- What are the information exchange linkages between forestry research, forest departments and farmers?
- What is the role of women in forestry development?
- What is the progress of the NGO grant program since its initiation?

Conclusions drawn from this study will help in identifying "lessons learned" among other forestry development projects managed by Winrock International and other development organizations.

## ***II. METHODOLOGY***

This section of the study explains the procedures used in collecting information from farmers participating in the FP&D project.

### ***STUDY AREA***

This report covers the Punjab and NWFP provinces. The present study includes the Attock, Rawalpindi, Jhelum and Gujrat project ranges of Punjab, and Kohat and Karak ranges of NWFP. Travel and time constraints preclude the study of Sindh and Balochistan experiences.

### ***DEVELOPMENT OF THE QUESTIONNAIRE***

An interview-style questionnaire was used to measure farmers' responses. After conducting a test in Gujrat, a few changes were made in the questionnaire.

### ***SELECTION OF FARMERS***

A formalized sampling scheme was not used because of time constraints. A tripartite design was the basis for choosing farmers. Area owned and total area planted into trees were the two major factors considered followed by the number of seedlings planted by the farmer. This selection process helped in obtaining information from a wide spectrum of participating farmers that covered the range of actual experience.

## ***FARM FIELD VISITS***

Project District Forest Officers (DFO) used the selection criteria in their respective divisions. DFOs chose farmers on the basis of the proposed criteria. A total of 19 farmers became participants in both provinces (Table 1).

**TABLE 1: SAMPLED FARMER DISTRIBUTION**

<i>Project Divisions</i>	<i>Punjab Province</i>	<i>NWFP Province</i>
Gujrat	3	
Jhelum	4	
Rawalpindi	2	
Attock	3	
Kohat		4
Karak		3
<i>Total</i>	<i>12</i>	<i>7</i>

## ***COMPILATION OF RESULTS:***

Preliminary results were analyzed to confirm questionnaire design, after visiting Gujrat, Kohat and Karak project divisions. After collecting data from the 19 farmers it was possible to formulate final results and draw conclusions.

## ***PAKISTAN FOREST INSTITUTE***

A visit to the Pakistan Forest Institute (PFI) in Peshawar was used to obtain information on the Institute's research and training activities. Discussions with forestry researchers provided useful information on constraints to conducting research in their respective fields. In addition, a formal questionnaire given to senior master's students under the FP&D project yielded 22 responses. In addition, two female foresters provided their opinions on the present and future prospects of women in forestry in an informal discussion.

## ***CONSTRAINTS OF METHODOLOGY:***

The methodology which was used had several limitations:

- Low sample size biases farm size distribution toward larger than average holdings.
- Despite being given selection criteria, Divisional Forest Officers (DFOs) could not choose farmers by these criteria because of time constraints associated with the visits. Furthermore there was a tendency for the DFOs to steer us towards the best farm plantations in their districts.

- Inherent bias of selecting samples from a biased population.
- Translation of questions put to farmers from English to Urdu and translations of answers from Urdu to English.
- Holidays such as Eid, Ashura-i-Muharran and American Independence Day made programming field visits difficult.

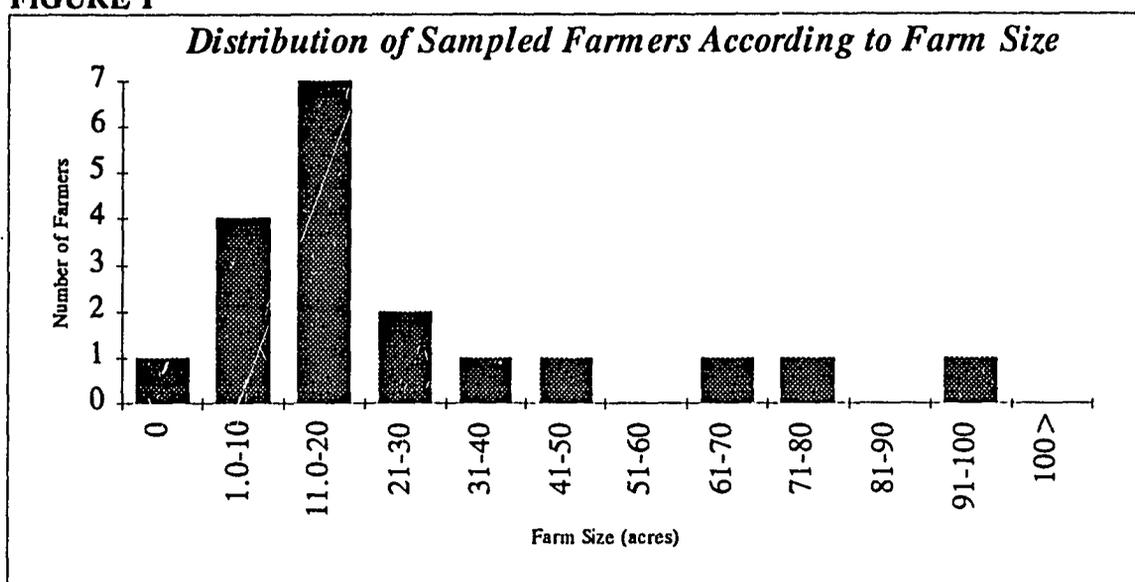
### **III. RESULTS**

Interviews given by farmers provided important information regarding their views of the project's activities and how it affects their lives. This section presents the results for the different elements of this study.

#### **GENERAL INFORMATION**

One way to obtain a small, yet diverse, sample of participating farmers, is to interview individuals owning different sized farms. The distribution of farmers according to farm size is as follows:

**FIGURE 1**



The distribution of sampled farmers identifies a strong inclination towards farmers having land holdings of 11-20 acres. However, interviewed farmers were selected from a broad range of farm size classes.

### *Do farmers have other sources of income?*

A majority of the tree farmers have outside jobs to supplement their income. This is not an uncommon phenomenon in Pakistan since most farms are family units in which at least one adult male is employed off the farm.

**TABLE 2**

<i>Sources of Income</i>	<i>No. of Farmers</i>	<i>Percentage (%)</i>
Farming	7	37
Farming + one outside job	8	42
Three different jobs	2	11
Owner of Construction Company	1	5
Student	1	5

### *What type of plantation designs do farmers use?*

The type of plantation design incorporated on these farms weighs heavily in favor of block. Eleven farmers chose this style while four chose a linear design with four planting a combination of both. The farmers with block plantations generally have larger farms.

## **INITIAL AND PRESENT EXPECTATIONS**

This section attempts to evaluate how farmers feel about the FP&D project. The supporting questions and results are:

### *How did sampled farmers hear of the Forestry Planning and Development project?*

**TABLE 3**

<i>Source</i>	<i>No. of Farmers</i>	<i>Percentage (%)</i>
Relative	2	11
Friend	5	26
Forest Officer	10	53
Advertisements (e.g., signs, bulletins, etc.)	1	5
Neighbor	1	5

Most farmers first learn about this project from provincial forest officers. Recommendations from relatives and friends also play an important role in passing information. One farmer who is also a mullah, actively discusses the importance of

trees during his sermons when traveling between villages. This is another way to disseminate information, even though its not shown in Table 3.

*Did farmers recognize the importance of trees and raise tree crops prior to the onset of the FP&D project?*

Prior to the FP&D project, 68% of the farmers raised some trees. Those farmers who had previously planted trees did so for many reasons, but primarily for domestic needs. However, local markets for firewood have existed for quite sometime. Selling the wood outside the farm on a larger scale and for markets such as poles, pulpwood, etc. is a more recent development.

*How does the project help farmers?*

**TABLE 4**

<i>Type of help</i>	<i>No. of farmers</i>	<i>Percentage (%)</i>
Free seedlings	14	74
Nursery	8	42
Site preparation	1	5
Technical Assistance		
-- Planting	4	21
-- Nursery establishment & management techniques	6	32

Note: farmers may select more than one response.

This is a very important question because it identifies what the farmers perceive as the most direct impact the project has had on them. For example, the FP&D project assisted farmers in determining land area for planting and how to space tree seedlings. In Table 4, the technical assistance for planting refers primarily to information on outplanting techniques, since the project does not actually plant the trees for the farmers.

*What plans do farmers have for the future?*

Every farmer sampled in this survey wants to continue farm forestry practices. They express this desire by wanting to increase the plantation size and replanting after final harvest. Some farmers have designed their plantations to capitalize on future eucalyptus coppice crops.

## ***ESTABLISHMENT AND MANAGEMENT OF TREE PLANTATIONS***

This section focuses on how farmers manage their plantations, what their problems may be and how, if at all, they manage for quality. The supporting questions and results are:

### ***Do farmers get seedlings of desired species?***

Every farmer in this sample received tree seedlings free of cost from a project nursery. In particular, 42% of the farmers received a contract from the provincial forestry departments to raise tree seedlings for distribution to other local farmers. In many cases, a large portion of outplanted seedlings occurred on the same farm that had the nursery. These farmers gave no information on percentage or quantity of seedlings given to other farmers.

In many cases, farmers had no problem obtaining a desired species. However, 42% of the farmers indicated difficulties in getting species they wanted. More than half of these individuals expressed interest in fruit trees and other timber species such as *Salmalia malabarica* (simal) and *Populus* spp. (poplar). Two other farmers expressed concern over not getting enough trees to establish their own tree plantations. They cited competition from other farmers as the chief reason.

Nurseries during Phase I of the project emphasized *Eucalyptus camaldulensis* seedlings. Other mixed species were available on a limited scale. Poplar did not become available until Phase II.

### ***Do farmers protect their trees?***

After outplanting the seedlings, it is important to protect them and provide ample care to maximize their growth and financial return. Most farmers, 84%, are protecting their seedlings. Protection against grazing is a major problem with 58% of the farmers protecting against it. Only one farmer expressed concern over insect attacks. A termite outbreak occurred in his plantation during the first year destroying most of his trees.

### ***How are farmers managing their plantation?***

In reviewing how farmers manage their plantations, three categories require attention--fertilization, watering, pruning and thinning. Only 26% of the farmers reported to have fertilized their trees at least once during the planting stage.

Watering or irrigating tree plantings is an important management activity that enhances the establishment and growth of seedlings. Every farmer participating in this sample used irrigation as a management tool, but with varying levels of intensity. However, irrigation of planted tree stock is not a formal part of this study.

Prior to this study, 32% of the sampled farmers conducted pruning operations. The volume of biomass removed from any given operation averaged 10.5 maunds per acre on an annual basis. The intensity of annual cutting ranges from 5 to 20 maunds per acre. (A maund is 40 kilograms, according to Leach 1993; *Tree Farmers Guide No. 7* 1993). Fuelwood is the principle use of this material. These same farmers usually plant more than one tree species laid out in linear design. Many farmers and professional foresters feel that pruning is not necessary for eucalyptus because of its natural tendency to self-prune and its use in markets which do not place a premium on wood quality. However, some farmers and foresters found it quite interesting to learn how pruning improves wood quality since quality affects the price of *Dalbergia sissoo* (shisham), simal, *Morus alba* (mulberry), poplar and *Salix tetrasperma* (willow).

Thinning tree plantations proved to be as elusive a management concept as pruning for 37% of the farmers. Few farmers conduct thinning operations, and if they do it tends to be in block plantations. Four farmers gave information on volumes thinned; three of these own block plantations. The number of trees is the standard for recording sales information for volumes sold. Generally the thinned material is used for construction poles called *balli*. All farmers sampled were able to sell the cut material. Merchantability of this material seems to be the driving factor behind thinning operations.

#### *What types of management problems do farmers experience?*

**TABLE 5**

<i>Type of problem</i>	<i>No. of Farmers</i>	<i>Percentage (%)</i>
Insect attack	9	47
Grazing	4	21
Soil Salinity	1	5
Soil hardpan	1	5
None	4	21

Precisely 78% of the farmers reported problems that need assistance. The biggest problem concerns insect attacks. Termites and ants are the biggest threat to tree survival. Farmers are experimenting with local pesticides to control this problem. In addition, grazing, another common problem, is quite unique in the NWFP. There farmers have problems with Afghan refugees releasing their roaming herds of animals on to local farm land. Local farmers are having problems resolving this problem.

#### **MARKETING OF HARVESTED WOOD PRODUCTS**

This section tries to answer the question 'how are wood marketing opportunities affecting their choices?' The supporting questions and results learned are:

### *Do farmers know where they will sell their wood?*

A majority, 68%, did not know where they would sell their wood. Many farmers hope that when the time comes for harvesting, the forest officers will assist them. However, many farmers do not worry because they intend to use their wood domestically.

### *What are the potential wood uses on farms?*

**TABLE 6**

<i>Type of use</i>	<i>No. of farmers</i>	<i>Percentage (%)</i>
Fuelwood	10	53
Construction (e.g., house, sheds, etc.)	8	42
Furniture	1	5

It is important to remember that wood use differs between farmers. Table 6 provides information on the different wood uses by sampled farmers.

### *Have markets changed with the increased planting of the trees? Are there more opportunities for sale?*

The idea behind this question and the previous one is to determine the farmer's perception of a changing wood market, and whether the farmer knows for what products to manage. Perceiving an increase in real opportunities to sell wood will help identify the farmer's motivation and enthusiasm for sustaining forestry practices.

All but one of the farmers answered "no" to the first question. The lone farmer who claimed that markets are changing said that refugees returning to Afghanistan are buying wood and are transporting it to build new homes. Regarding the second question, 79% of the farmers said opportunities for sale had increased since planting trees. In other words, more people are approaching tree growers and making offers to buy their wood. This is an encouraging sign and will provide the farmer market information on the types of sale opportunities that are available for wood material.

### *Have trees had a significant influence in supplementing annual farm incomes?*

Only a few farmers out of 58% who responded affirmatively would provide information on what percentage their annual income increased from the sale of trees. The remaining farmers gave no response because their plantations are too young for harvesting.

*Do farmers sell trees to middlemen?*

**TABLE 7**

<i>Sell trees to middlemen</i>	<i>No. of farmers</i>	<i>Percentage (%)</i>
Yes	6	32
No	5	26
No response	8	42

Analyzing the impact of the middleman's influence, on flow of wood between the grower and manufacturer, is necessary. According to our sample of farmers, very few sell wood directly to middlemen. The majority of farmers who gave no response have plantations that are too young for harvesting.

To better understand whether the farmer knows the end uses of his or her wood, it was necessary to ask if he or she knew where middlemen market it. Unfortunately, only four farmers had knowledge, of the end use of their wood. Since middlemen may transport wood long distances and to intermediate wood markets, it is not unlikely that farmers would not generally know how their wood is used and who purchased it (e.g., fuelwood for cooking, poles for construction, etc.).

*Do farmers sell directly to wood product manufacturers?*

**TABLE 8**

<i>Sell directly to wood product manufacturers</i>	<i>No. of farmers</i>	<i>Percentage (%)</i>
Yes	5	26
No	7	37
No response	7	37

One would think that if few farmers are selling to middlemen then they must be selling directly to the wood product manufacturers. However, this is not the case. Only five farmers in this sample are selling directly to wood product manufacturers. Farmers frequently sell their trees to other farmers within their communities. The majority of farmers who gave no response have plantations that are too young for harvesting.

*Do farmers receive better prices for selling directly to manufacturers than to middlemen?*

**TABLE 9**

<i>Receive better prices</i>	<i>No. of farmers</i>	<i>Percentage (%)</i>
Yes	2	11
No	0	0
No response	17	89

No one, with the exception of two farmers, could determine whether selling directly to the wood manufacturer is better than selling to the middleman.

### ***EFFECT OF EXTENSION AND OUTREACH PROGRAM***

This section compiles data for answering the question 'how is the outreach program providing the linkage between the research, forestry departments and farmers?' The supporting questions and results are:

#### *Did farmers know how to plant trees prior to FP&D project?*

Sixty three percent indicated yes. Does this mean that training activities to improve tree planting techniques are a waste of time? No, it does not. Training farmers is necessary to prevent J-rooting on poorly planted trees especially with potted seedlings. Furthermore, 37% represents a significant farmer audience that is in need of tree planting information.

#### *Are extension foresters accessible?*

Farmers are accessing extension foresters. Farmers are evenly split between having foresters visit more often and less frequently. This question tries to determine the channel of information flow between foresters and farmers. However, this question may not consider all factors influencing the exchange.

#### *How do extension sponsored training functions impact farmers?*

Only 11% of the farmers sampled attend such training sessions. These sessions train farmers in tree planting techniques and serve as motivational rallies to get more of them interested in the project. Few other topics are discussed. These functions may serve more as a socializing event to discuss other things.

#### *Do farmers need additional help from extension foresters?*

Despite the frequency of extension forester visits, 58% of sampled farmers request additional assistance with managing or increasing the size of their tree farms.

*What skills do farmers learn from the FP&D project?*

**TABLE 10**

<i>Skills learned</i>	<i>Number of farmers</i>	<i>Percentage</i>
Planting	19	100%
Tree protection	15	79%
Pruning	10	53%
Thinning	11	58%
Harvesting	12	63%
Marketing	4	21%
New Research Techniques	19	100%

Note: farmers may specify more than one skill.

When assessing the effectiveness of an extension program, it is necessary to ascertain whether the receiving population is acquiring new skills and using them. Accomplishing this objective requires asking farmers whether they receive training in the following subjects: planting, protection, pruning, thinning, harvesting, marketing and new research technologies.

The provincial forestry departments conduct almost all planting technology transfers. Given the high annual establishment and survival rates for plantations, the numbers of farmers professing both planting and protection skills appear consistent with field observations. However, the remaining figures need further explanation.

Even though 53% of the farmers receive training in pruning technologies, only 26% actually prune their plantations. Telling a farmer how to prune a branch is one thing, but until that person actually does pruning his or her need for additional training may not arise. In many cases when a question during a tree planting function regarding pruning is answered the number of people in attendance will count as trained farmers. The Winrock International Technical Assistance Team (TAT) conducts many field training sessions on pruning operations.

According to the above table, 58% of the farmers receive training in thinning technologies. However, only 21% actually do it. In most cases, when a farmer thins, it is for the purpose of removing larger, marketable trees rather than an improvement cut.

Harvesting is another area where skills' transfer is important. Twelve out of 19 farmers receive instruction on harvesting methodologies, yet only 42% actually do it. In many cases, the farmer does not actually harvest the trees himself, but has a middleman do it.

Farmers want to obtain marketing skills. According to this survey, only 21% of the sampled farmers receive instruction on marketing. However, it's important to know that this survey is liberal in its use of the word "trained". Some farmers do know certain markets. For example, they will check local markets for current wood prices before accepting a bid from a potential buyer. However, they do not necessarily know how to grow trees for that particular market.

Additionally, it is important to determine whether new technologies are being disseminated to farmers. New technologies could be better pesticides, new equipment design, genetically enhanced seedlings, etc. Unfortunately, the question did not translate well. For example, some people consider planting in itself to be new technology. Little information other than new spacing prescriptions is conveyed to farmers.

In addition, little farm forestry research is actually being done on farm land. Only one farmer responded yes to this question. He is a nursery owner who had the opportunity to experiment with poplar clones. Farmers who have several years of experience planting trees initiate their own private experiments to answer particular questions and some will experiment from the start.

An important aspect of any outreach program should be the distribution and use of extension materials. In this survey, 74% of the farmers receive newsletters or other educational packets to help them manage their tree plantations. However, it is not clear whether farmers receive adequate information regarding aspects of forestry.

### ***FORESTRY TRAINING AT PAKISTAN FOREST INSTITUTE***

A random sample of 22 students received a questionnaire asking them to comment on their experiences as recipients of scholarships from the FP&D project. The questions from the questionnaire and results are:

*What are the students' reasons for joining M. Sc. Program under the FP&D project?*

Students had four different responses to this question. Approximately 41% of the students joined the project primarily because of the financial assistance offered. Another 27% joined the project because they wanted to do something innovative and interesting. In addition, 18% of the student body joined to improve their education and 14% to fight environmental degradation.

*How do students view training at PFI?*

This section is an attempt to express ten different concerns given by the sampled student body. These concerns break down into both positive and negative responses.

### *What are the positive responses?*

As part of their social forestry training, all students must participate in field trips to tree farms. Roughly 86% of the students felt that these were helpful in learning about farmer problems. Fifty-four percent felt that the FP&D project provided good opportunities for research. In addition, 77% of the sampled student body thought that PFI provides adequate facilities for learning.

### *What are the negative responses?*

An important issue brought up by these students was lack of social forestry courses. They want an increase in the number and modification of existing social forestry courses. This criticism reflects the opinions of 45% of the sampled students. In addition, a group of 27% wants a reduction in the overall course load in general because of the frequency of physical training and sports activities. Another 14% felt that more books on social forestry should be available either at the library or on sale. Outreach training is an important part of the social forestry program, yet 54% of the students think that additional practical training is necessary. While some liked the discipline structure of PFI, 54% disliked it and felt that it was an impediment to effective learning.

### *What problems have been overlooked?*

The sampled students only mentioned two problems: job opportunities and lack of interest on their training by the FP&D project. The concern over job opportunities was expressed by 27% of the forestry students while 23% claimed that FP&D had no interest in their training. The lack of interest on the part of the FP&D seems hard to believe. Outside consultants were contracted to teach plant water relationships, ecology and economics courses at PFI. Plus the project has supported the development of teaching materials and textbooks. In addition, most of these students receive financial assistance by the FP&D project. Maybe more public relations is needed by the FP&D project to inform people of its activities.

### *What plans do students have for the future?*

More than half, 55%, of the current forestry graduate students do not have immediate plans after graduation except to look for employment. Another 36% of the students expect to start their careers with their respective provincial forest service. The remaining 9% of the students want to continue their education.

## **FORESTRY RESEARCH**

A major goal for forestry research given in the project paper is to increase Pakistan's research experience and capacity to provide the base of information and data necessary to design effective afforestation strategies (PFI 1993). Forestry research was especially

strong in plant propagation and species selection, but lacked in areas of inter tree/crop relationships, applied social science, and growth and yield relationships.

The FP&D project PC-1 reduced the selected study areas to the following:

- Socio-economic surveys
- Design and yield of farm forestry systems
- Species/Ecological trials and seed supplies
- Hydrological studies

The project activities include 35 research programs initiated over the last seven years (PFI 1993). They cover the following study areas:

**TABLE 11**

<i>Study areas</i>	<i>Number of projects</i>
Socio-economic surveys	6
Design and yield of farm forestry systems	10
Species/Ecological trials and seed supplies	10
Hydrological studies	9

Of the 35 projects listed, 13 are complete. The remainder are still in progress with five projects being converted to demonstration sites.

A study by Drs. B.A. Wani and C.R. Hatch reviews several aspects including:

- Manpower and Financial Resources
- Impact of Training on Research
- Information Exchange Linkages of Research to Farmers

The last aspect is a combination of work found in the literature, conversations with peers and from interviews with farmers.

*What are the impacts of manpower and financial resources on research?*

According to Wani and Hatch (1993), the financial resource for PFI research is steadily declining over time. This steady decline has mainly come from the GOP component while the USAID component appears to follow an inconsistent up and down flow on a yearly basis. Greater funds are necessary for operational activities, allowing PFI

researchers to conduct more on farm studies. A reduction in these funds eliminates the researcher's ability to conduct effective farm forestry research outside the PFI facilities in Peshawar (Wani and Hatch 1993). This loss of funds further inhibits the researcher's ability to conduct studies to meet farmers' needs.

### *What are the impacts of training on research?*

While the fiscal budgets have been declining for the research component of PFI, the training funds have been increasing. However, USAID has been increasing training funds at the expense of lower research budgets. For example, in 1987, USAID contributed 1.4 million rupees for training and 0.8 million rupees for research. In 1992, research used only 0.5 million while training used 3 million rupees (Wani and Hatch 1993). Assuming that more extension foresters will improve information dissemination, training more foresters is important. However, losing more research funds in the process, means that foresters will have less new information to disseminate in the future.

### *What are the information exchange linkages from research to farmers?*

According to the project design, provincial outreach activities focus on working with farmers on technical problems of nursery and plantation management, and with wood product manufacturers on their production and marketing problems. However, when this subject surfaces, the classic reaction is that research conducted at PFI is not relevant to the needs of small farm foresters. Only one farmer sampled claimed to have active research on his lands.

## **WOMEN IN FORESTRY**

One of the FP&D project goals is to include women in forestry development. Bringing women into the decision-making operations of the forestry department is a high priority of the project sponsor, USAID. The first step toward getting women into professional ranks of the forest service is placing women in the forest departments as field officers, extension/outreach specialists and research staff. This review of the WID activities reflects interviews with staff and the first group of female foresters.

Women working in the field express several difficulties (Muhammad 1991 and personal communications). Some of the problems are:

- Male colleagues do not include women in the decision-making process.
- Lack of female forest technicians and extension workers.
- When traveling, accommodations are not adequate.
- Not being treated as equal partners.

- Stereotyping of women foresters as different because they are from urban areas.
- Poorly educated rural women live as submissive housewives confined to indoor activities.
- Forest department staffs have reservations about women working outdoors.

Employment of women by NGOs has demonstrated that many of these problems can be overcome. However, in public service, women are still a long way from being incorporated into field positions in forest departments.

### **NGO PROGRAM**

A new component of FP&D is the NGO Grant program, which began operations a year ago. The basic objective of this program is to give grants to Pakistani NGOs and PVOs to undertake many different environmental and conservation management projects on forest and wildlands. In all, 33 grants have been awarded to 24 NGOs/PVOs in the country (Appendix A3). A major part of the grant disbursements is for seedling production (51%) with environmental awareness (33%), biodiversity (12%) and lastly, NGO capacity strengthening (4%). One of the important aspects of NGO Grant program is its support of diverse activities throughout the country that complement other components of the FP&D project. For instance, the NGO Grant program's 33 grants have an activity distribution of:

**TABLE 12**

<i>Activities</i>	<i>No. of Projects</i>	<i>Percentage (%)</i>
Strengthening NGOs institutional capacity	4	5.8
Increasing community environmental awareness	10	14.5
Increasing value of wood production	28	40.5
Training	24	34.8
Survey	2	2.9
Research	1	1.5

Note: a single grant may support more than one project or activity.

A major grant criterion is that the applying organizations should be financially stable and have a track record of satisfactory financial management. Only 13% of the grants by the NGO Grant program were awarded to NGOs which financially contributed resources to the project. The NGO Grant program totally supports the remainder.

The NGO Grant program awards grants for long and short-term projects. A majority of the grants (63 %) are for periods of 10 months to one year whereas the remainder are among three to nine months. Measuring the success of the program can only take place after the completion of the majority of their sponsored projects. One criteria for their success is the NGO's predicted ability to operate after the withdrawal of FP&D Project financial assistance.

#### ***IV. GENERAL DISCUSSIONS AND CONCLUSIONS***

The main purpose of this section is to analyze and discuss the study's findings regarding the objectives stated in the introductory section.

The broad question asked in this study is whether the project was successful from its own merits or from being in the right place at the right time? We know that more than half of the sampled farmers had already planted trees for profit. This suggests that farmers were already aware of the importance of trees and were trying to capitalize on this resource. In other words, yes, this project did occur at the right place at the right time. Motivating farmers to plant trees is not difficult when market prices are high and wood supply is limited. They needed a mechanism to expand and intensify farm forestry on a greater scale. Provincial forest officers claim that they motivated the farmers to plant trees, but many farmers already saw the benefits of supplementing their annual income by growing trees. Given the project's good timing, its own merit has greatly transformed the country side and helped farmers realize the benefits of farm forestry.

Let's look at the main question of this study 'how did farmers respond to tree planting opportunities?' Planting operations began slowly due to the two-year start-up delay and problems relating to the traditional role of territorial foresters vis-a-vis local farmers. Traditionally, the forester controlled the forest resource that was important to local communities. The forester had the power to permit or cancel the exploitation of resources from provincial forest reserves. This did not foster a trusting relationship between the two parties. This uneasy relationship presented problems early in the project and overcoming them by a series of steps was necessary. The first step was to get the foresters out of their para-military uniforms and into traditional dress. This initial step made the forester less threatening and helped put the farmer at ease. The remaining steps will not be covered here. However, after solving the first problem, farmers responded by planting more trees each year.

Another problem was the belief among farmers that the project, seen as the federal government, would take over the farmland planted in trees. The project has been successful in dispelling the traditional notion of the public sector owning all forest resources. These farmers are confident that their plantations will help them financially and everyone interviewed in this study expresses a desire to continue with farm forestry after harvesting the first rotation of trees.

## ***ARE FARMERS MANAGING FOR TREE QUALITY?***

The importance of this question is whether farmers are managing for tree quality to maximize net returns. This question focuses on the key management tools for producing quality. These tools are spacing, fertilization, protection, pruning, thinning, irrigation and harvesting at an appropriate rotation age.

So are farmers managing for quality? The answer is no, partially because farmers have received little training to effectively manage their trees for quality and because there is little price incentive to do so for eucalyptus. We know that 131,436 farms have participated in the project by planting trees throughout the four provinces of Pakistan. We also know that 1,374 farmers received training in plantation management and marketing. If we assume, one farmer for each participating farm then only 1% of all farmers received training in tree quality management technologies whereas 98,796 farmers, or 75%, received training in planting technology (Appendix A2). This disparity between the numbers of farmers trained in both categories obviously points to the crucial area where extension programs need to focus their energy. Achieving this one percent was accomplished largely by members of the WI Technical Assistance Team in an attempt to aid the Provincial Forestry Departments.

When visiting farms that are participating in the planting program of tree seedlings' one will see plantations that have spacings that are too tight. This overstocking of seedlings per acre exists because farmers believe that the more trees you have, the more money you will get after harvesting the trees. However, forest officers may encourage farmers to plant trees at close spacings because they get more trees in the ground with fewer farmers, thus more easily meeting their sole project target -- trees planted.

Tree protection is another important practice that enhances tree health and wood quality. Farmers well understand the impacts that grazing cattle have on their planted seedlings. However, when trees are of a certain size, they peg their cattle within the plantation where they tend to rub off tree bark leaving quality-diminishing scars behind. Additionally, not everyone understands the impact of insects. Many farmers are currently experiencing isolated problems with termite and ant attacks. Trees' survival is more important to a farmer than producing wood quality.

If farmers are taught pruning technology, they can produce high quality wood. However, not all trees should be pruned. For example, eucalyptus trees have low quality wood, as well as the ability to self-prune, making the additional cost of artificial pruning unfeasible (*Tree Farmers Guide No. 2* 1992). When farmers do prune trees, they tend to prune their *Delbergia sissoo* (shisham) and *Populus spp.* (poplar). Shisham and poplar produce high valued wood.

Although the spacing problem is important, farmers can solve it by thinning their plantations. As mentioned in the result's section, only 37% of the farmers thin their plantations. There could be several reasons for this:

- Inexperience is a major reason. If they do harvest trees, they remove too few or only the merchantable stems, leaving the poor quality ones still standing.
- Farmers may understand the concept of inventory but not necessarily of quality.
- Plantation ages are not old enough to justify a thinning.
- They can not sell the sub-merchantable material from a thinning from below.

The rotation age of a plantation is another important element in producing high quality wood. Longer rotation ages will yield greater volumes of high quality wood. However, this requires a longer delay in regaining one's initial investment capital. A typical farmer who plants *Eucalyptus camaldulensis* will harvest the plantation at five to eight year rotations. This short rotation age reflects the farmer's time preference for regaining his initial capital investment. The reasons for this short time preference may vary from relieving a temporary cash flow problem to financing a family wedding.

Managing trees for quality is an important way for farmers to maximize their net return on investments. Better quality woods yield the manufacture of higher quality products. For example, eucalyptus firewood earns a lower return on investment than growing poplar for matches. Shisham, another high quality wood, used as veneer sheets in the plywood industry commands better prices than either firewood or matches. To maintain the long-term sustainability of private forestry in Pakistan, farmers must realize net investment returns by establishing and managing plantations for a profit at or above their opportunity cost.

### ***HOW ARE WOOD MARKETING OPPORTUNITIES AFFECTING FARMER CHOICE?***

An interesting way to approach this question is to ask whether the farmers know where they would sell their trees at the end of rotation. Most farmers do not know where they will sell their trees. However, this lack of information is not preventing them from making an initial investment or expanding their existing plantations.

Asking farmers whether markets have changed since they started forestry activities is another important question. Market changes in the supply and demand can shift the types of wood used for specific purposes (e.g., matches, pulpwood, etc.). Most claim that these changes have not occurred. This common perception of markets not changing suggests that farmers will increasingly grow trees for the manufacturing of lower-end quality products. Wood buyers are increasingly approaching farmers to buy trees. This trend of increasing demand is motivating farmers to plant more trees. In addition, wood scarcity on a regional level gives the farmer a sense of confidence in selling their future trees.

How do farmers sell their wood? According to many farmers, a middleman will approach them regarding the possible purchase of their trees. Selling wood is usually on a standing tree basis. This means that a wood purchaser will walk around the farm plantation and purchase the trees he likes. Unfortunately this leads to high grading. The number of trees and potential end use determine what is the basis for weight measurement and payment.

The results of this study are inconclusive regarding the role of middlemen. Traditionally the middleman is the linkage between manufacturers and tree growers. This study suggests that farmers are evenly selling wood to product manufacturers and middlemen. However, the majority having immature plantations have not conducted any type of sale to date. Further study on older plantations may provide more fruitful information. Many farmers who do sell to middlemen do not know where the wood goes afterwards. When farmers lack appropriate marketing information, they have to manage their plantations on the basis of previous experiences. These experiences may not be in line with the wants and needs of forest product manufacturers.

There is a common belief among professional foresters that middlemen are not necessary and take away the potential extra profit from tree farmers. They suggest that farmers should harvest, transport and sell their wood directly to producers. Some farmers are currently selling wood this way, but how realistic and feasible is this? Most farmers are raising trees on a part-time basis to supplement their incomes and do not have the time to spend on plantation management. In addition, they generally do not have the proper knowledge and equipment, nor initial capital, to start such an operation. This attitude is reminiscent of similar small landowner responses in southern New England. Middlemen provide an important service of getting the wood from tree growers to forest product manufacturers. They function like logging contractors in the United States and earn reasonable livelihoods. It's up to the provincial foresters to help the farmers get the necessary information to maximize net returns from their forestry investments.

Given the lack of data, the few farmers selling directly to wood product manufacturers have had mixed experiences. One claims to receive better prices. Another farmer harvested his wood from Kohat, NWFP, and transported it directly to a forest product mill in Jhelum, Punjab. The transportation cost of sixteen rupees per maund disappointed him. He and other neighboring tree farmers in the NWFP would rather sell their wood at lower prices and not bother with selling directly to the forest product industry. Many of these farmers are expressing an unrealistic price expectation for their eucalyptus wood. They want shisham prices for eucalyptus without completely understanding the mechanical nor market differences between the two species. However, this may highlight a useful niche for middlemen. They can buy wood at higher prices and transport it more cheaply. Both groups may benefit after the farmers become more knowledgeable in dealing with them.

## ***EXTENSION AND OUTREACH PROGRAM***

In a forestry development project of this size, the extension and outreach aspects are important in sustaining farm forestry over the long haul. The transfer of technologies from the extension forester to the farmer is only one strand in the network that encompasses industry as well.

Before this project started, farmers were already planting trees to meet domestic needs. They had the basic skills to perform this task along with the ability to select and plant appropriate species. However, when the project initially offered eucalyptus seedlings farmers did not know much about them and needed help. They had been previously planting kikar (*Acacia nilotica* which is known as babul in Sindh), shisham, and poplar, all of which have known qualities and sell readily in the open market.

The extension program had a slow start, but after developing a series of demonstration nurseries and plantations, it became very effective in getting farmers to plant trees. Forestry department officials selected farmers to sign contracts and accordingly instructed them on nursery establishment and management. Seedlings produced in these nurseries rivaled or exceeded similar production in departmental nurseries, both in quality and quantity.

In addition, the extension program was also effective in teaching farmers to plant trees in the field. However, more work is necessary in getting farmers to understand the importance of planting trees at proper spacing. Misinformation about actual prices received for single trees have farmers planting as many trees as possible in a limited area hoping they get that 'fabled' price for each tree. It is hard to say how this idea started, but its imperative that farmers be taught otherwise to avoid disappointment and lower interest in forestry.

The program needs to give more attention in developing the relationship between the people who conduct research, extension forestry officials and the tree farmer. cursory glances at this topic suggest a few comments are in order. For instance, criticizing researchers for not conducting research appropriate for field activities is common. Forcing researchers to think of potential problems and conduct experiments accordingly demonstrates the lack of necessary feedback by forestry officials in the field. In many instances, if research does not help forestry officials meet their planting targets then it's not considered useful. The break down in identifying client needed research and field implementation requires a new approach.

An effective extension and outreach program should be coupled with a client driven applied research program. This program would identify the clients, assess their needs, design appropriate research, disseminate results to the clients, and expand research focus as client needs change (Gordon and Bentley 1990). This process could be hastened and strengthened by sharing and extending the existing body of scientific knowledge.

## ***FORESTRY TRAINING AT PAKISTAN FOREST INSTITUTE***

When analyzing the comments made by forestry graduate students, it is important to consider the history of student acceptance and training at PFI. Historically, everyone applying to PFI was examined by the Public Service Commission (PSC) board. If the candidate qualified, a provincial forestry department offered him a secure job and trained him in forestry for two years at PFI. A "secure job" meant that the candidate would have a job after he graduated from PFI.

The start of the FP&D project not only changed the acceptance process and training emphasis, but other traditions as well. For instance, students previously were trained for government work. Now they are being trained to work in the private sector as well. This shift in training emphasis disrupted a traditional working role for foresters in relation to farmers. Whereas in the past foresters controlled farmer access to the resources, they now had to help farmers manage their own resources. This also changed how the training for students was sponsored. The FP&D provided individuals with full scholarships to attend PFI. This allowed provincial forestry departments opportunities to avoid recruitment delays, save stipend costs and still select highly qualified individuals for government service. Most importantly it opened forestry training to both men and women. It created major change.

The PFI organizational structure resembles the design of an authoritarian military command system. The curriculum reflects this through compartmentalization of course topics gearing forest officer training to work in government service. Previously, there had been little fraternization between individuals destined to be ACFs and DFOs. This system fostered a rigid curriculum of specific courses required by each student with little room for change. In other words, PFI is training foresters for service with provincial forestry departments, not for work in the private sector. Changing traditional systems takes time. Hopefully, within the next few years, it will be possible to develop a revised course curriculum and a broader perception of forestry. The diverse opportunities for work in the private sector require specific skills. For example, NGOs want people who not only have technical knowledge but can motivate others, communicate well and negotiate conflicts. Forest product companies want individuals trained in wood technologies, communications and, most importantly, business.

Most students worry about getting a job after graduation. The FP&D scholarships provide no job guarantees to students after graduation. There are opportunities in the NGO and industrial sectors, but history and tradition cast those possibilities under a shadow of insecurity. Steps are necessary to reverse this trend so that private farm forestry does not disappear.

To help make this transition, establishing a career resource function within PFI is critical. It should devote its efforts solely to finding job opportunities for students and making linkages to NGOs and the private sector. The TAT has informally tried to help

students who want to work with private organizations. However, it can not maintain and sustain this network.

Various evaluation teams suggest expanding the two years B.Sc. to four years, as well as transferring it to other universities. Either solution poses advantages and disadvantages, neither of which are debated here. However, it is imperative that a third year be added at PFI or neighboring institutions to rectify the educational, technical deficiency problem amongst students. This third year is essential for students lacking background in the sciences and/or the humanities and arts. Forestry is a broad profession that encompasses many fields and disciplines. Graduating students from PFI, whether they join government service or the private sector, need these new skills to make effective resource management decisions in a changing world.

Suggestions have been made to change the location of forestry education. However, there is no practical alternative for the near future other than to keep forestry education at PFI, despite its drawbacks. Compared to other universities, having student disruptions, ill discipline and corrupt entry and examination systems, PFI at least has good disciplinary rules (FSMP 1992).

### ***FORESTRY RESEARCH AT PAKISTAN FOREST INSTITUTE***

Despite many problems, research is being conducted at PFI at a fairly productive rate given limited financial resources. PFI is financed by the federal government and through research grants. However, it does not have adequate government funding to carry out an effective research program in all of its functional areas. Maintaining the organization consumes most of its resources. These limited financial resources reduce the number and size of farm forestry research projects and restricts them to the Peshawar area. PFI's development funding in 1991-92 was only 40% of that received in 1986-87 (Wani and Hatch, 1993). It is not possible for PFI to plan and carry out long-term research programs under such constraints.

PFI has conducted several research projects under the four study areas outlined in the project papers. The majority of studies have been either to design farm forestry systems or conduct species trials. However, few social science studies exist suggesting more attention is essential for this topic (TRD, Inc. 1991). Another area needing attention is the growth and yield of linear and block plantations on farmlands. Substituting different species in these same studies could also provide new technical information to tree farmers. This would allow the farmer to plant what he or she wants and lowers the risk load to his or her investment portfolio. In addition, studying appropriate coppicing techniques for eucalyptus plantations will greatly help farmers reduce regeneration costs (*Tree Farmers Guide No. 3* 1992).

PFI's impressive coverage of research subjects and numerous publications have failed to stimulate interest among provincial forest departments (FSMP 1992). The forestry officials claim that PFI's research is not relevant to the work they are doing in the field. There is an apparent indifference among operational foresters and certainly a

lack of appreciation for applied research. This lack of coordination between the researchers and extension foresters cries for a client driven program where research is focused on the specific needs of the client (Gordon and Bentley 1990). The extension foresters, as well, must show sensitivity in identifying the clients needs.

The project benefits from PFI's historical focus on farm forestry research and uses that research to leverage an increased level of activity. However, during the past two years, the project's research program, handicapped by a reduction in operating funds, is unable to expand its activities. Reversing this trend during the final year of the project will hasten the development of new technologies for farm forestry programs in Pakistan.

### ***WOMEN IN FORESTRY***

The first step in getting women involved in forestry is to train them. In 1988, the first four women entered PFI and generally integrated well into the training program. Although accepted by their fellow male students, some faculty members were more skeptical and disliked their presence (Naughton 1993b). Another problem was housing for these women. Special arrangements were necessary for this first group while a special hostel was constructed for them.

The next step for these women was the prospect of getting a job in a profession long inhabited by men. The TAT provided some early opportunities to prevent these women from being lost. Two of the four started their careers as employees of the TAT. One currently is a lecturer at PFI while the other one, after working with the Aga Khan Rural Support Program, is an M.Sc. student at PFI. In addition to these women there are at least 10 women working in natural resource positions throughout Pakistan. These women represent foreign based NGOs and these NGOs will probably continue to hire forthcoming women graduates with some possibly going with local NGOs. Employment with government agencies will be difficult in the near term.

#### *What are the future plans for WID projects?*

According to Muhammad (1991), the project will continue promoting WID activities both on a governmental and local level. She expects NGOs to be the main driving force promoting and continuing WID activities. Women will be successful in forestry. They have a good start since few of the graduated women foresters remain unemployed. However, there is a long struggle ahead, particularly against some of Pakistani society's tendencies to differentiate women from men. For example:

- Lodging is a major constraint while traveling.
- Society considers working in the forest at night and other aspects of the profession a man's job.

- Women are not being treated as equal partners in field work.

Actively campaigning to resolve these difficulties will dispell the belief that women can not work in forestry.

### ***ROLE OF NGOs IN PRIVATE FORESTRY DEVELOPMENT***

Throughout the world and especially in South Asia (with the notable exception of Pakistan) the actions of NGO/PVOs have been instrumental in developing and implementing natural resource policy and providing outreach to the rural communities (Naughton 1993a). The FP&D project's NGO Grant program, initiated a year ago, has a goal to create a core of Pakistani NGO/PVOs that can plan and implement natural resource management programs upon the project's completion. The major operational objective of the NGO Grant program is to provide grants to Pakistani NGOs and PVOs undertaking environmental and conservation management projects on forest and wildlands. Furthermore, NGO/PVOs will use the money to increase their technical ability and capacity to undertake activities like habitat improvement or conducting public awareness programs through mass media and schools.

The NGO Grant program has gotten off to an excellent start with a large number of grants distributed to groups sponsoring diverse activities. Response by participating NGOs has also been encouraging. Most of them are completing their targets. The second major activity of NGOs is training farmers to protect their environment or raise and plant trees. The scope of this activity needs to be broad enough to include training in management and harvesting of tree crops, particularly in those areas where the FP&D project is actively establishing plantations on farmlands. Marketing of farm-produced wood remains a relatively low priority topic in local NGO programs.

One of the most discouraging aspects of the NGO Grant program is lack of interest shown by NGOs directed by women to initiate forestry projects. Reasons for this reluctance needs to be assessed. A better understanding is necessary before emphasis is placed on forestry as an income-generating activity for women.

The sustainability of private forestry activities coordinated by local NGOs are not guaranteed. The withdrawal of the NGO Grant program support will threaten the continual participation of many local NGOs in forestry activities. Presently, only 11% of these NGOs contribute any of their own financial resources to forestry projects.

### ***V. LESSONS LEARNED***

This project is ambitious. It was ambitious for the Government of Pakistan because government forestry officials had never helped farmers manage farm forestry. Winrock had never had a forestry project, and was just formed from the merger of three organizations. This was by far USAID's largest farm forestry project. USAID's

mission in Pakistan grew from a small office to a substantial size over a short time span.

It's most notable accomplishments have been the nationwide acceptance of private forestry as a feasible land use alternative for farmers. Reforestation of large areas of land, once barren, is achievable.

Its failures reflect training and outreach programs being too narrowly focused. This is not to say that certain individuals have not made outstanding contributions to reverse this project design flaw. Research issues were not really dealt with and appropriate topic areas and financial problems will linger into the future.

### ***FOCUS OF PROJECT STRATEGIES***

Planting trees as a strategy for reforestation is an effective tool achieving specific goals such as number of hectares converted from wasteland to plantations. Farmers were ready for a program to come along and help them start forestry practices on a greater scale. It made the use of tree planting targets easy to achieve. However, at a certain point in time, its simplicity failed to capture the complicated nature of forestry and changes in strategy needed to be developed. For example, once planting large areas was successful, it might have been feasible to shift funding resources to develop the forest product industry to become the motivator for reforestation.

Subsidized tree seedlings were initially destined to be phased out by USAID, but this idea was not solidly implemented and once this subsidy was initiated it was impossible to eliminate. Farmers will not start large forestry operations on their own, knowing that they can receive free seedlings. Some farmers are voicing resentment that USAID is leaving when the work is not yet complete with good reason.

This project is important in overcoming the "chicken or egg" syndrome by establishing a sizable supply base of wood resources to attract industrial development. However, subsidizing tree seedlings is not sustainable over the long-term. Once industry starts to utilize this wood resource, efforts should be redirected to help industry become well adjusted to using wood materials. This should be in the form of better manufacturing equipment to increase efficiency of production and output of quality products.

Linkages between industry and farmers might be improved through the development and use of written contracts. Farmers grow trees of a specific type and grade and industrialist guarantee to buy them or have first rights of refusal. Such contracts could include annualized payments to farmers by industry at a pre-arranged price with the harvesting of all wood material being the responsibility of industry.

### ***PROJECT DESIGN PROBLEMS***

Setting targets is good for keeping a project focused. The narrow focus of the PC-1 on "tree planting" targets led to a failure in recognizing other measurable outputs such as

management and marketing as legitimate project targets. This rigid adherence to targets blinds people to other important project components needed to make the project sustainable over the long-term. Constant concern over meeting annual tree planting targets steers people away from producing quality outputs. Reforesting 25% of the country is an ambitious goal, but what good is that statistic if half the trees do not survive or succumb to growth stagnation?

Another design problem that was overlooked was industry being a project client, rather than simply a possible market for farm wood products (Naughton 1993). There was no provision for training people in the industrial sector or in treating them as project clients; yet the key to institutionalizing private forestry is in the strengths of the industrial based wood demand and market infrastructure.

A third problem was Forest Department (Project) staffing (Naughton 1993b). The system of constantly re-posting DFOs and CFs had an adverse effect upon project momentum and continuity. Maintaining posts for more than the duration of the projects allows for effective working relationships to develop and greater achievement of project goals.

The last problem discussed here is that of FP&D project expansion. When the Government of Pakistan (GOP) developed the PC-1 for Phase II, they made one very serious mistake: they allowed for the massive expansion of the area covered by the project without providing for more manpower, equipment, facilities, and budget resources. This over-expansion sacrificed quality for quantity and jeopardized the sustainability of the project.

### ***THE ROLE OF MIDDLEMEN AND THE SERVICE SECTOR***

Farmers have traditionally sold their stumpage to middlemen who in turn sell it elsewhere. Yet, GOP and others feel that wood producers would gain more if the trees were sold directly to the end user. The margin between the price paid to the farmer and the price charged to the end user often seems too much (Clark 1990; Naughton 1993b).

However, the middleman provides valuable services that farmers can not afford or do not have time to provide for themselves. For example, middlemen harvest trees, buck them into merchantable size and transport them to distribution centers or the mill. The GOP and the project should recognize these phenomena and further study the valuable role middlemen play. Attention is essential in training these people in how to provide adequate services to farmers and how to strengthen the inter-link between this group and industry.

## ***TRAINING & EXTENSION***

Training is an important part of private forestry development. Current training practices miss the opportunity to more effectively help farmers. The project is very successful in having people formally trained in forestry at domestic and foreign universities. However, few farmers receive training on forestry subject matters other than nursery production and plantation establishment. Although private forestry development takes time and Pakistan is still in the early stages, farmers need more assistance. They are already harvesting trees and are doing so in increasing numbers. Farmers are at a critical stage, where they will decide whether to continue with forestry or change to an alternative land use.

## ***FORESTRY RESEARCH***

Forestry research is doing well considering limited financial resources. However, poorly established linkages between the field foresters and researchers hamper its ability to conduct effective farm forestry research. Researchers are not getting active feedback from forestry officials, forcing them to follow their own biases. This communication break down is detrimental to the farmer who needs technical assistance through his first tree crop rotation.

## ***PROJECT NURSERIES***

Failure to meet agreements with nurserymen on time complicates forestry development strategies. When provincial allocation for funds regarding seedling production is uncertain, provincial forest officers must be conservative in their production requests from nurseryman. In addition, rigid contracts permitting nurserymen to sell their seedlings only after official permission are quite detrimental to the farmer. Dedicated provincial foresters who consider long-term sustainability of private forestry important, must avoid broken agreements whenever possible.

## ***ESTABLISHMENT AND MANAGEMENT OF TREE PLANTATIONS***

This lesson encompasses certain aspects of training and extension. There are many tree farms established throughout Pakistan needing technical assistance in management. After overcoming the initial problems of getting farmers to accept project seedlings, little effort is spent in helping farmers effectively manage their plantations. Although farm forestry is new, many farm plantations are close to harvest and need attention.

It is important to emphasize that plantation establishment and management go hand in hand. If the objective is to assist farmers in maximizing net returns from tree crops, then extension work does not stop after planting the seedling. Extensive effort must be spent to train farmers on how to prune trees for improving wood quality when applicable and how to thin plantations to maximize yield. The primary transfer of these technologies occurs through the efforts of the TAT, but their effectiveness diminishes

with a project of this size. Greater effort is necessary on a nationwide scale to help farmers produce high quality wood to attract manufacturers of higher valued wood products.

### ***WOMEN IN FORESTRY***

The FP&D project is a pioneer in trying to get women established in forestry throughout Pakistan. Early efforts to train women at PFI faced housing constraints. After constructing a women's hostel, women attended in greater numbers. Training women in forestry is one accomplishment, but creating employment opportunities is another. Some members of the first group of women foresters received work offers from the FP&D project. So what will happen to the current class of women foresters after graduation? As of yet it's not clear what will happen as they compete with the male members of their class for jobs. Some suggestions are to have the provincial forest departments establish women forestry wings to alleviate employment problems. Evaluating whether this employment scheme is appropriate needs further investigation. Training women for forestry has its own merits, but it is also important to consider cultural barriers and how to overcome them before real progress towards full integration of the work place is achieved.

### ***ROLE OF NGOs IN PRIVATE FORESTRY DEVELOPMENT***

This aspect of the FP&D project has critical importance in continuing the practice of farm forestry after project termination. Unfortunately, the FP&D NGO Grant program has only been in operation for one year. So far it emphasizes grants to organizations sponsoring tree nurseries and planting activities. This early emphasis on tree nurseries is not the sole objective of the unit. It should act more as a focal point in leading the gradual expansion of the program into more diverse arenas of opportunities. The FP&D staff and NGO Unit are going through learning periods where both mistakes and successes occur. The major lesson learned is the importance of starting an NGO Grant program early on in the project's activities rather than near the end. This would allow the NGO Grant program ample time to progress through the learning stage and ready itself for the critical role of developing private forestry in Pakistan.

## ***VI. REFERENCES***

- Clark, W.P. 1990. Marketing farm produced timber in Pakistan. Report under contract to Winrock International for the Government of Pakistan & U.S. Agency for International Development, Forestry Planning and Development Project. 99 p.
- FSMP. 1992. Forestry Sector Master Plan (*Volume 1. National Perspective*). The Government of Pakistan (June 1992); Prepared by Reid, Collins and Associates, Canada

- Gordon, J.C., and W.R. Bentley. 1990. Handbook on agroforestry research management. Oxford & IBH Publishing, New Delhi. 72 p.
- Leach, G. 1993. Farm Trees and Wood Markets: A review and economic appraisal. Pakistan Household Energy Strategy Study (Hess). Stockholm Environment Institute. 85 p.
- Muhammad, M.W. 1991. WID Activities in the Forestry Planning and Development Project. Pakistan Forest Institute and International Labour Organization Workshop on Employment of Women in Forestry in Pakistan on April 27-30, 1991 in Peshawar, Pakistan.
- Naughton, G.G. 1993a. Proposed Strategy for support of NGO activities associated with the Forestry Planning & Development Project. In: Proceedings of the Forestry Extension Coordinators Meeting, January, 1993. 65-68.
- Naughton, G.G. 1993b. End of Tour Report. Forestry Planning & Development Project, Government of Pakistan-USAID, Winrock International Technical Assistance Team. 35 p.
- PC-1. 1990. Forestry Planning and Development to Organize, Establish and Expand Energy Plantations on Private lands in Pakistan, Revised (1984-1993). Ministry of Food, Agriculture and Cooperatives, Government of Pakistan, Islamabad. 144 p.
- PFI. 1992. Forestry Statistics of Pakistan. Pakistan Forest Institute, Peshawar. 17 p.
- PFI. 1993. Progress of Research and training of the Pakistan Institute under Forestry Planning and Development Project up to March, 1993. Pakistan Forest Institute, Peshawar. 28 p.
- Tree Farmers Guide No. 2. 1992. Pruning Timber Trees. October, 1992. Winrock International. Islamabad, Pakistan. 2 p.
- Tree Farmers Guide No. 3. 1992. Managing Coppice Guide. October, 1992. Winrock International. Islamabad, Pakistan. 2 p.
- Tree Farmers Guide No. 7. 1993. Estimating Weight of Standing Eucalyptus Trees. March, 1993. Winrock International. Islamabad, Pakistan. 2 p.
- TR&D, Inc. 1991. Mid-Term Evaluation of Forestry Planning and Development Project. USAID Pakistan. 172 pp.
- Wani, B.A. and C.R. Hatch. 1993. PFI Research Review. Special Report. 7 p.

Winrock International. 1991. Project Profile: Pakistan Forestry Planning and Development, Phase II. Islamabad, Pakistan. 4 p.

***APPENDIX***



# FORESTRY PLANNING & DEVELOPMENT PROJECT

## Government of Pakistan-USAID

### INFORMATION SHEET

March 1993

Project Tenure: 1985 - 1994

#### Purpose:

To help Pakistan increase its energy self sufficiency and reduce deforestation, using the Social Forestry approach i.e., taking forestry assistance to the people and encouraging development of the private sector in forestry. This involves the use of forest officers as teachers and technical advisors to farmers and private industries, and stresses the point that Pakistan should NOT rely totally upon government forests for its needs.

The project has FIVE operational thrusts:

1. Strengthening forest policy;
2. Reversal of deforestation through tree crop management on private lands;
3. Improvement of forestry education and training;
4. Expansion of forestry research;
5. Developing farm forestry outreach.

#### Total Value:

- US government grant US\$ 27.5 Million, Government of Pakistan US\$ 14.0 Million.

#### Project Areas:

##### Punjab

District Rawalpindi, Attock, Gujrat, Jhelum, Chakwal, Khushab, Gujranwala, Sialkot, Narowal and Tehsil Mian Chunnu.

#### Balochistan

District Quetta, Sibi, Duki, Loralai, Kachi, Tamboo, Dera Allah Yar, Usta Muhammad.

#### NWFP

District Peshawar, Mardan, Kohat, Karak, Bannu, D.I. Khan,

#### Sindh

District Sanghar, Nausheroferoze, Nawabshah, Mirpur-Khas, Hyderabad, Thatta irrigated plantations.

#### Progress to Date:

- 131 million tree seedlings raised in over 4,700 farmer operated nurseries and planted on nearly 131,000 farms, (enough to provide 7.6 million tons of wood).
- Construction of 4 Km of Canals with ancillary works, and establishment of 3,393 acres of irrigated plantation in Dharo Forest, Thatta Plantation.

#### Training:

(Number of individuals trained)

##### (a) In Pakistan

Farmers:	103,059
Staff:	773
B.Sc.:	47
M.Sc.:	43

##### (b) Overseas

M. Sc.:	13
Short term:	96

#### Tours:

(Number of participants)

- Inter provincial/inter departmental: 1,191
- Overseas: 28

#### Research/Training:

- Support for research and training is provided at the Pakistan Forest Institute (PFI), Peshawar; Punjab Forestry Research Institute (PFRI), Faisalabad; Sindh Forest Department Research Station, Miani and Provincial Forestry schools.

- 40 Research projects and studies are being conducted at different Field stations throughout Pakistan. Two studies have been completed & results disseminated.

#### Other Assistance:

- Accommodation:
  - Nursery huts, office & residence for project staff constructed at district level.
  - Hostel at PFI.
  - 1 Research Center in each Province. Centres at Kharian (Punjab) and Ratta Kulachi (NWFP) are complete.

- Laboratory equipment procured for PFI, PFRI.
- Computers provided to forest staff, PFI and PFRI.
- Vehicles, tractors and Bulldozers provided for outreach activities and land development work.

 Winrock International

Technical Assistance Team

TREE PLANTING AND NURSERY PRODUCTION STATISTICS BY PROVINCE  
FORESTRY PLANNING AND DEVELOPMENT PROJECT

PROVINCE/ ACTIVITY	(1985-86)	(1986-87)	(1987-88)	(1988-89)	(1989-90)	(1990-91)	(1991-92)	Thru 3qtr (1992-93)	TOTAL 1985-93
<b>PUNJAB</b>									
ON FARMS									
1. No. Farms	112	761	2,952	4,320	6,974	27,704	11,836	6,630	61,289
2. No. Plants	54,554	755,327	1,790,773	3,974,403	6,476,904	14,850,127	15,300,207	10,742,161	53,944,456
NURSERY									
1. No. Units	19	49	100	209	566	992	566	271	2,772
2. No. Plants	1,388,500	2,622,500	4,074,624	5,500,580	13,791,972	17,328,900	13,023,560	8,323,600	66,054,236
<b>NWFP</b>									
ON FARMS									
1. No. Farms		1,400	3,807	7,501	16,861	20,307	10,673	3,363	63,912
2. No. Plants		670,892	1,901,142	3,226,481	4,491,000	8,001,800	6,917,100	2,581,000	27,789,415
NURSERY									
1. No. Units		31	46	81	148	171	192	138	807
2. No. Plants		2,494,468	4,293,790	4,144,137	3,297,620	10,409,700	10,111,900	3,826,000	38,577,615
<b>BALUCHISTAN</b>									
ON FARMS									
1. No. Farms			636	715	1,016	654	2,180	1,000	6,201
2. No. Plants			621,680	457,818	1,993,398	2,139,814	10,827,194	3,445,000	19,484,904
NURSERY									
1. No. Units			6	8	74	213	295	400	996
2. No. Plants			394,000	300,000	1,940,000	3,000,000	9,284,000	8,000,000	22,918,000
<b>SINDH</b>									
ON FARMS									
1. No. Farms								34	34
2. No. Plants								367,000	367,000
NURSERY									
1. No. Units			1	1	1	1	4	126	134
2. No. Plants			135,000	140,000	105,000	70,000	180,000	2,437,400	3,067,400
<b>PFI</b>									
ON FARMS									
1. No. Farms									0
2. No. Plants									0
NURSERY									
1. No. Units		1	1	1	1	1	3	2	10
2. No. Plants		165,000	136,000	94,630	185,000	182,000	95,200	63,000	920,830
<b>ALL PROVINCES</b>									
ON FARMS									
1. No. Farms	112	2,161	7,395	12,536	24,851	48,665	24,689	11,027	131,436
2. No. Plants	54,554	1,426,219	4,313,595	7,658,702	12,961,302	24,991,741	33,044,501	17,135,161	101,585,775
NURSERY									
1. No. Units	19	81	154	300	790	1,378	1,060	937	4,719
2. No. Plants	1,388,500	5,281,968	9,033,414	10,179,347	19,319,592	30,990,600	32,694,660	22,650,000	131,538,081

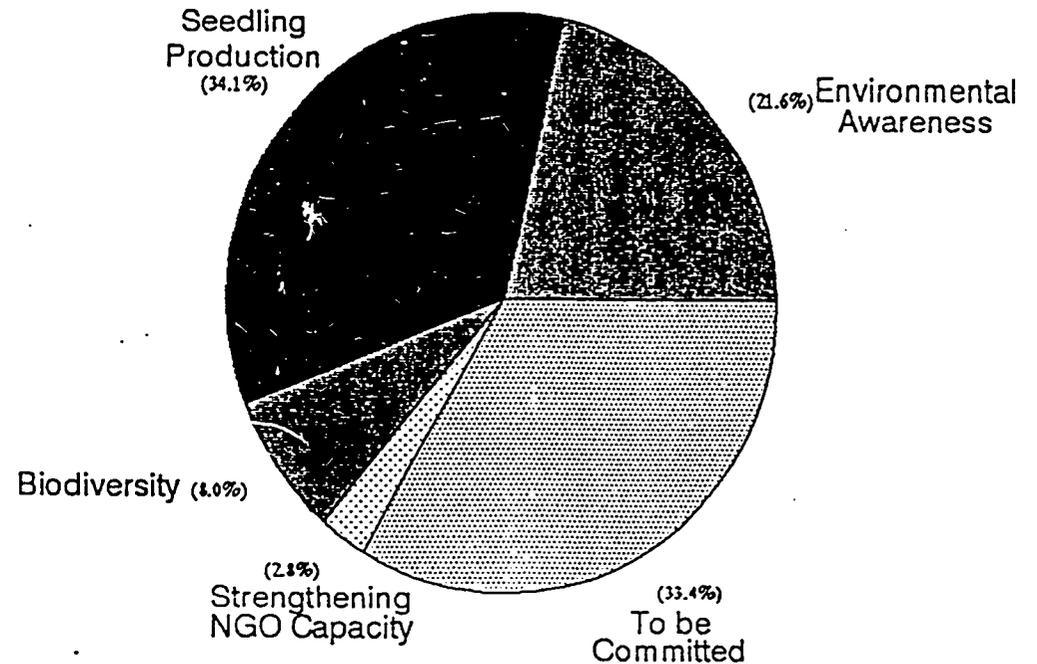
25

# DETAILS OF GRANT COMMITMENTS

Contract Number	Sub-grantees	Amount Committed
01.	PTFS, Islamabad	500,000.00
02.	Fountain House, Lahore	250,000.00
03.	NFGC, Lahore	190,000.00
04.	WWF, Lahore	300,000.00
05.	WWF, Lahore	700,000.00
06.	OPP, Karachi	161,500.00
07.	SWA, Matua	50,000.00
08.	Saiban, Hyderabad	125,000.00
09.	SRSC, Peshawar	800,000.00
10.	PTFS, Islamabad	323,000.00
11.	PTFS, Islamabad	750,000.00
12.	PYC, Hyderabad	70,000.00
13.	PEPF, Peshawar	393,000.00
14.	Anjuman-e-Kasht Karan	200,000.00
15.	Fountain House, Lahore	30,000.00
16.	HLPP, Hafizabad	30,000.00
17.	NFGC, Lahore	381,600.00
18.	Belour Advisory, Gilgit	240,000.00
19.	SAFWCO, Shahdadpur, Sanghar	175,000.00
20.	PRSP, Shakar Garh	360,000.00
21.	Dar-ul-Falah, Teh. Samundri	122,700.00
22.	WWF	118,800.00
23.	SWA, Matua	50,000.00
24.	J&K Scientific Farming Foundation (SFF)	200,000.00
25.	Rural Development Foundation (RDF)	211,200.00
26.	Horticulture Foundation of Pakistan	479,000.00
27.	SCOPE, Karachi	200,000.00
28.	Community Support Program, Hafizabad	50,000.00
29.	PEPF, Peshawar	170,000.00
30.	NFGC, Lahore	414,000.00
31.	Zubaida Welfare Association, Islamabad	100,000.00
32.	PEPF, Islamabad Chapter	124,000.00
33.	Social Welfare Society, Changa Bangial	55,000.00
<b>Total:</b>		<b>8,323,800.00</b>

[As of May 31, 1993]

Categorized Percentages of Committed Grants



CATEGORIES	
Environmental Awareness	2,704,800.00
Seedling Production	4,264,000.00
Biodiversity	1,000,000.00
Strengthening NGO Capacity	355,000.00
<b>Total</b>	<b>8,323,800.00</b>

26

## PROFORMA FOR EVALUATION OF PRIVATE TREE FARMS

Village: \_\_\_\_\_

Tehsil: \_\_\_\_\_

District: \_\_\_\_\_

Date: \_\_\_\_\_

Category: \_\_\_\_\_

### INTERVIEW WITH TREE FARMER

#### I. GENERAL INFORMATION

1. Owner's name/Parentage: \_\_\_\_\_

2. Total area owned: Irrigated \_\_\_\_\_ Non-Irrig. \_\_\_\_\_

Total planted area: \_\_\_\_\_

Type of planting: \_\_\_\_\_

3. Is farm part of project? Yes: \_\_\_\_\_ No: \_\_\_\_\_

If no, why not? \_\_\_\_\_

4. Major source(s) of livelihood: \_\_\_\_\_

5. Place of residence: \_\_\_\_\_

#### II. INITIAL & PRESENT EXPECTATIONS

1. How did you hear of the FEF Project? \_\_\_\_\_

2. Did you like it's activities? Yes: \_\_\_\_\_ No: \_\_\_\_\_

If yes; then why? \_\_\_\_\_

If no; then why? \_\_\_\_\_

3. Do you think that the project has come up to your expectations? Yes: \_\_\_\_\_

No: \_\_\_\_\_

If no; then why? \_\_\_\_\_

4. Had you been growing trees for profit before hand?

If yes; Type of planting done: \_\_\_\_\_

Was it profitable: \_\_\_\_\_

If not; i) Did you think it would be financially sound to plant trees as a crop? \_\_\_\_\_

ii) Did you think it was a risky alternative to what you have already been doing? \_\_\_\_\_

\_\_\_\_\_

iii) What were the constraints to tree planting?

\_\_\_\_\_

5. In how many ways has the project helped you? \_\_\_\_\_

\_\_\_\_\_

### III. PRODUCTION AND MANAGEMENT OF TREE PLANTATIONS

1. Where did you get your tree seedlings? \_\_\_\_\_

2. Was there any problem in obtaining seedlings of your liking from the project nurseries?

Yes: \_\_\_\_\_ No: \_\_\_\_\_

If yes; then what were the problems: \_\_\_\_\_

\_\_\_\_\_

Have those problems been solved? Yes \_\_\_\_\_ No: \_\_\_\_\_

If no; then why? Any suggestions? \_\_\_\_\_

\_\_\_\_\_

3. Did you buy any seedlings? yes: \_\_\_\_\_ No: \_\_\_\_\_

If yes then;

Species	Quantity(No.)	Buying Price	Buying Place

4. Where and when did you plant them?

Species	Planting Place	Year	Quantity Planted(No.)	Quantity Replaced(No.)

5. Reasons for poor survival? \_\_\_\_\_

6. Cost incurred on planting?

a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

d) \_\_\_\_\_

7. At what spacing did you plant your trees? \_\_\_\_\_

No. of trees per acre? \_\_\_\_\_

8. Did you provide protection to trees? If yes; then how?

\_\_\_\_\_

If no; then why? \_\_\_\_\_

\_\_\_\_\_

9. Any problem in management of your plantation?

\_\_\_\_\_

10. Do you intend to continue forestry practices? If yes, then of what sort: \_\_\_\_\_

If no, why? \_\_\_\_\_

11. How are you managing your trees?

i) Fertilizer? Yes: \_\_\_\_\_ No: \_\_\_\_\_ If yes, how often: \_\_\_\_\_

ii) Pruning? Yes: \_\_\_\_\_ No: \_\_\_\_\_ If yes, how often: \_\_\_\_\_

iii) Thinning? Yes: \_\_\_\_\_ No: \_\_\_\_\_ If yes, how often: \_\_\_\_\_

#### IV. MARKETING OF HARVESTED WOOD PRODUCTS

1. Before planting your trees, did you know where you would sell them? Yes: \_\_\_\_\_

No: \_\_\_\_\_

i) If yes then where? \_\_\_\_\_

\_\_\_\_\_

ii) If no then what plans were in your mind? \_\_\_\_\_

\_\_\_\_\_

2. If you planned to use the wood on your farm, how were you going to do so?

\_\_\_\_\_

\_\_\_\_\_

3. After planting your trees, have the markets changed? Are there more opportunities of sale?

\_\_\_\_\_

\_\_\_\_\_

4. Have you harvested any wood from your plantation? If not then why?

\_\_\_\_\_

\_\_\_\_\_

If yes then:

Species	Age	Quantity harvested			Selling form	Selling price	Market
		Prun.	Thinn.	Final			

\_\_\_\_\_

5. Has tree planting improved your earned income from your farm? Yes: \_\_\_\_\_ No: \_\_\_\_\_

If yes, then contribution of forestry in your total income (%age)?

\_\_\_\_\_

If not, then why? \_\_\_\_\_

6. How much wood do you use on your farm?

Annually? \_\_\_\_\_ Periodically? \_\_\_\_\_

Could you guess a value? \_\_\_\_\_

7. How do you sell your trees? Through Middleman? Yes \_\_\_ No \_\_\_

If yes, does he harvest and transport your trees? \_\_\_\_\_

If no then how do you make a sale? \_\_\_\_\_

8. Do you know where the middleman sells the wood?

Yes: \_\_\_\_\_ No: \_\_\_\_\_ If yes then to whom? \_\_\_\_\_

9. Have you ever sold wood directly to a product manufacturer?

Yes: \_\_\_\_\_ No: \_\_\_\_\_ If yes did you receive a better price than selling to a middleman?

V. EFFECT OF EXTENSION AND OUTREACH PROGRAM

1. Did you feel that you had the knowledge to grow trees successfully?

\_\_\_\_\_

\_\_\_\_\_

2. Have extension foresters been able to provide you with information you didn't already know?  
If so, was it useful? How? \_\_\_\_\_

3. How many times does extension forester visit your plantation?

\_\_\_\_\_

How frequently would you like one to come by? \_\_\_\_\_

Is it easy to find one if you need? Yes: \_\_\_\_\_ No: \_\_\_\_\_

4. Have you conducted or participated in any of the field days or workshops arranged by the project? If conducted then how many and of what sort?

\_\_\_\_\_

If attended then which one? \_\_\_\_\_

5. Were they useful to you? If yes then how? \_\_\_\_\_

If no then how? \_\_\_\_\_

6. Do you need further help from the extension officer? If yes then of what sort?

\_\_\_\_\_

\_\_\_\_\_

42

7. What forestry skills have you learned from extension foresters?

Planting: \_\_\_\_\_

Stand Management

Protection: \_\_\_\_\_

Pruning: \_\_\_\_\_

Thinning: \_\_\_\_\_

Harvesting: \_\_\_\_\_

Marketing wood products: \_\_\_\_\_

New research techniques: \_\_\_\_\_

8. Has anyone conducted research on your land? Yes: \_\_\_ No: \_\_\_

9. Have you recieved any type of educational material from the project? Yes: \_\_\_\_\_ No: \_\_\_\_\_

## ***PROFORMA FOR SENIOR M.Sc. STUDENTS***

1. Why did you decide M.Sc./B.Sc. programme under FP&D project?
  
2. Do you think that you have been fully trained in social forestry? If not, what is lacking?
  
3. Has FP&D project taken the right steps in training you? If not, what mistake has it made? How could it have been better?
  
4. What plans do you have after completing your training in October of this year?
  
5. Do you like the Institution with which you are training?  
If yes, why?  
  
If no, why not?
  
6. Does it provide adequate facilities for learning?
  
7. Have you had a chance to visit tree farms? How has your training prepared you to deal with their problems?

## **GENERAL EVALUATION FOR WOMEN IN FORESTRY**

1. Why did you choose forestry as your profession?
2. What did you think of your education?
3. What is your field of specialization in forestry?
  - i.) Specialization
  - ii.) Thesis
  - iii.) Job
4. What kind of difficulties have you encountered as a female forester?
5. Have you overcome these difficulties? How?  
  
If not, can it be done institutionally?
6. In your opinion, what are the problems and successes of the FP&D project relating to WID, forestry, etc.?
7. In your opinion, what are the problems and successes of the NGO unit relating to WID, forestry, etc.?
8. Are there enough female foresters?
9. How are job opportunities for female foresters now?

10. What kind of opportunities will exist in the future?
11. How can you increase these opportunities?
12. What sort of jobs would be most suited to women in forestry?
13. Reasons given by forestry departments for not accepting women as professionals?