

FORESTRY RESEARCH PAPER SERIES

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**AN EVALUATION OF LEKHNATH PANCHAYAT
COMMUNITY FOREST DEVELOPMENT PROJECT**

Bhoja Raj Ojha

**HMG-USAID-GTZ-IDRC-FORD-WINROCK PROJECT
STRENGTHENING INSTITUTIONAL CAPACITY IN THE
FOOD AND AGRICULTURAL SECTOR IN NEPAL**

FOREWORD

This Forestry Research Paper Series is funded through the project, "Strengthening Institutional Capacity in the Food and Agricultural Sector in Nepal," a cooperative effort by the Ministry of Agriculture (MOA) of His Majesty's Government of Nepal and the Winrock International Institute for Agricultural Development. This project has been made possible by substantial financial support from the U.S. Agency for International Development (USAID), the German Agency for Technical Cooperation (GTZ), the Canadian International Development Research Centre (IDRC), and the Ford Foundation.

One of the most important activities of this project is funding for problem oriented research by young professional staff of agricultural agencies of the MOA and related institutions, as well as for concerned individuals in the private sector. In particular, funding is provided by the Ford Foundation to support research activities related to the human aspects of natural resource management. This research is carried out with the active professional assistance of the Winrock staff.

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TABLE OF CONTENTS

	Page
INTRODUCTION	2
Project Area	2
Forest Type	2
Deforestation	3
FOREST PRODUCTS	3
Fuelwood	3
Timber	3
Fodder	4
LEKNATH PANCHAYAT COMMUNITY FOREST DEVELOPMENT PROJECT	4
Nursery Establishment	4
Nursery Operation	5
PLANTING AND PROTECTION	6
THE FOREST	7
Demarcation	7
Panchayat Forest	7
Panchayat Protected Forest	7
Forest Management Plan	8
PLANTATION SURVIVAL	8
PRIVATE PLANTATION	9
FACTORS AFFECTING PLANT SURVIVAL	10
STOVE PROGRAM	11
EXTENSION PROGRAM	12
CONCLUSIONS	12
RECOMMENDATIONS	13
APPENDIX	14

LIST OF TABLES

Table 1. Seedling Data	6
Table 2. Panchayat Forest (PF) Area	7
Table 3. Panchayat Forest Handed Over to Lekhnath Panchayat	7
Table 4. Plantation and Survival Records	8
Table 5. Survival Rates of PF	9
Table 6. Survival Rates of Bare Root and Polypot Seedlings	9
Table 7. PF Survival Rates by Plantation	10
Table 8. Species Survival Rates of PP	10
Table 9. Stove Installment	11

AN EVALUATION OF LEKHNATH PANCHAYAT
COMMUNITY FOREST DEVELOPMENT PROJECT

Bhoja Raj Ojha*

INTRODUCTION

The Lekhnath Panchayat Community Forest Development Project (CFDP) has been in progress since 1979/80. The project, financed by HMG/N and the World Bank with the technical collaboration of UNDP and FAO, aims to increase the supply of fuelwood, fodder, and timber. The objective of this study is to assess project activity in Lekhnath Panchayat (LP), Kaski District, in terms of target attainment.

The data used in the study is based on primary sources. The project record (register), relevant people at the project site, and local people are the sources of data about the forest resource before and after the start of the project.

Project Area

Lekhnath Panchayat lies 9 km east of Pokhara in Kaski District. It is bounded by Begnas Panchayat to the east, Rakhi and Pokhari Panchayats to the west, Kalika Panchayat to the north, and Bharat Pokhari Panchayat to the south. Altitude varies from 750 meters in the south to 1100 meters in the north. Prithwi Highway passes through the panchayat.

The panchayat has a humid subtropical climate; temperatures range from 16C to 26C. Average annual precipitation is 3880 mm. Most rainfall is during the monsoon (June to September).

Forest Type

Prior to deforestation, large trees such as chilaune, sal, katus, kirro, tooní, faledo, and khayar were abundant. The local people could easily find enough timber, fuelwood, and fodder nearby.

More specifically, schima wallichii (chilaune), castanopsis hystrix (patale katus), castanopsis indica (dhale katus), cedrela toona (tooní), woodfordia fronchiosa (dhaya), and phyllanthus emblica (amala) grew on the hillsides. In steep slope pockets both shorea robusta (sal) and mixed forest were found. Bomax malabaricum (simal) and syzigium cumini (jamun) were the main species growing on lowland. Acacia catechu (khair) and dalbergia sissoo (sissoo) remained predominantly on the southern sandy area around the Seti River.

Dendro calamus strictus (bans) and other bamboo species grew everywhere, on forest and privately owned land. Imperata sp. (seru), egragos-tis tenella (banso), and typha angustata (khayr), useful for both roofing and animal fodder, were also widespread.

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Deforestation

Increasing population pressure has escalated the demand for wood. Large trees have been cut for timber and fuelwood, and free grazing of livestock has added to the degeneration of small forest plants.

About 1964-65, there was heavy immigration into the panchayat, mostly in Wards 2 and 3. In all except Wards 4, 5, and 6, immigrant settlements increased in the next few years and deforestation accelerated. In 10 to 15 years, almost all the forest had become bare land.

The main causes of the continuing deforestation are:

- drastically increased timber, fuelwood, and fodder demand due to natural and migratory population growth;
- overlopping and overgrazing;
- no provisions for replanting;
- nationalization of forests and creating of the Forest Department caused local communities to feel relieved of any responsibility;
- royalty evasion, leading to tree cutting at night; and
- transformation of depleted forest land into settlements and cultivated land.

Instead of controlling the use of forest products, forestry officials viewed the forest as a source of income. With threats of imprisonment and fines, they could easily take money illegally from tree cutters. Both parties benefitted because the cutters did not have to pay royalties. This substantially contributed to forest destruction.

Forest burning continued out of ignorance. Seasonal ground cover grows well after being fired, but gradually the large trees and plants refused to grow back. The landslide of Rithepani Danda, in Ward 3, is the outcome of such burning.

FOREST PRODUCTS

Fuelwood

Villagers used to gather fuelwood twice a year, once before the onset of winter (October/November) and once before the start of the rains (March/April). There was always a sufficient quantity, and rather than collecting dry wood, they cut trees and major branches. Fuel became scarce. Now the women children who collect fuelwood go every day and walk long distances to neighboring panchayats for small bundles.

One alternative source of energy for cooking and heating is kerosene. It costs NRs.6 per liter in Pokhara when available. Others include electricity, coal and natural gas. However, low incomes and general poverty rule out all energy sources except fuelwood. Demand and supply of forest products must be regulated; two activities are needed: fuelwood trees must be planted on both public and private land, and the people must be taught to use more fuel-efficient stoves.

Timber

Shorea robusta and *schima wallichii* are the best woods for housing construction. Almost every house has been built with these timbers and

no more large trees, let alone timbers, are left now. People either buy timber from the timber corporation in Pokhara or bring it from Tanahu, Chitwan, or the northern belt of Kaski District.

Fodder

Badahar, kutmiro, nebharo, dabdabe, and ginderi are the most highly valued fodder species. The former three are the most scarce. They grow along gully borders, on wasteland, and non-irrigated terraces. Due to the increasing fragmentation of land holdings, fodder trees on private land are limited.

Crop residues are available in limited amounts during the monsoon. Green weeds and grasses grow on the edges of cultivated land. The main residue is rice straw but millet and maize stover are also fed to animals. However, in subsistence farming large quantities cannot be spared.

Weeds and other ground grasses of the forest have been destroyed by overlogging and overgrazing. Limited grazing land remains due to the increasing need for farmland. When all possible land is under cultivation during the monsoon and premonsoon months, stall feeding with hand-cut grass is practiced widely. This has two advantages: the immediate benefit from the plantation, and the reduced risk of fire during the dry season. Ignorantly, the villagers prefer to free graze their cattle because stall-feeding requires more human effort.

LEKHNATH PANCHAYAT COMMUNITY FOREST DEVELOPMENT PROJECT (LP CFDP)

Physical targets are fixed annually according to need and availability of resources. The general objectives of the LP CFDP are to:

- establish a nursery;
- rebuild, demarcate, and hand over Panchayat Forests (PF) and Panchayat Protected Forests (PPF) to the panchayat;
- distribute seedlings for private planting; and
- distribute improved stoves

Nursery Establishment

By 1980-81, one panchayat nursery, with a capacity of 25,000 seedlings, had been established at Jukekuna, in Ward 6. It was established to afforest bare land (PF), enrich the existing degraded forests (PPF), and distribute them to farmers for planting on their own land.

The site for the nursery had to be:

- close to the village; the naike (the first foreman in the panchayat) can then motivate villagers to plant seedlings;
- within 20 mt of the Arghaun Bazaar Water Supply Reservoir;
- close to the planting area (most of the barren and public hill land in the panchayat is in Ward 6);
- within easy reach of nursery construction materials; stone and bamboo are available in the locality and sand can be easily transported from outside (the nursery is connected to Prithwi Highway at Lekhnath Chowk by a 2 km motorable road); and
- where labor is available.

The nursery area of one ropani is bounded by a stone wall three feet high and one and a half feet wide. It is just sufficient to keep out cattle. Eight terraces, four meters wide on average, and one transfer path in the center of the nursery were laid. A shed, working area, and water tank were constructed on the highest terrace. The shed (three by four meters) was made of bamboo with khar roofing. Slate and bamboo were to edge the seedling beds. The transplant bed is one meter wide and about eight meters long. The polythene tube is 18 cm tall.

Nursery Operation

Planning: No plan has yet been implemented, and serious problems have arisen particularly with seedling production. In an attempt to meet production targets, any available seed species were used and many had low survival rates. Planting fodder and fruit species in the PF is a typical example. The survival rates of nebharo (*ficus roxburghii*) and utis (*alnus nepalensis*) were very low in PF but high on private plantations. They were destroyed by livestock.

Supply, storage, and saving seeds: Given the lack of large seed-providing trees, the project must depend on the Forest Department for seeds. In most cases, the naike has to travel without pay for up to three days. Villagers who own fodder trees should be encouraged in such cases to bring fodder seeds to the nursery. Some seeds, such as kutmero, kangiyo and others are locally available, but in limited quantities.

Seeds are stored in sacks and tin trunks in a dry room in the Pokhara District Forest Office, but not at the nursery. Some have been damaged by rain and vermin. Only recently have a few small tin trunks been issued to the naike.

Small seeds, such as utis (*alnus nepalensis*) and gobre salla (*Pinus wallichiana*), are sown in seedbeds. Most others are sown directly in polypots. Sometimes the seedlings have to be resown because of poor germination. After this, a mulch of straw and leaves is used in pots and seedbeds, and removed when germination starts to avoid dampness.

In recent years, the chemical insecticides BHC, malathion (dust), and metacid (emulsifiable concentrate which must be diluted and sprayed) have been annually applied to protect the seedlings from insects. The naike weeds and prunes the roots regularly.

Three registers are kept in the nursery. The Nursery Register records details of the operation and information on the seed species being used. The Nursery Distribution Register includes records of seedling distribution for private planting with the names and addresses of the recipients. The Visitor's Book keeps a record of visits made by forestry officials and other visitors, and their comments.

Most seeds are sown directly in polythene pots and those that are not, are potted later. Seeds that produce more than one plant, lapsi for example, are sown in seedbeds. The number of seedlings sown has varied from 25,000 (1980/81 and 1984/85) to 38,200 (1981/82). Although the capacity of the nursery is 25,000 seedlings, some seedlings can be produced twice a year. Seedling species that will meet timber, fuelwood and fodder requirements have been raised (Appendix).

PLANTING AND PROTECTION

The first seedlings were transplanted in 1981. By 1984, a total of 58.5 ha had been planted in LP. A heralu (forest watcher) was appointed in each plantation for its protection. The sites selected as PF were public land. To ensure a good environment for the seedlings, a site is prepared by cutting grass with a small sickle.

No analysis has been done on matching species to land type. Seedlings are usually raised according to whatever seed is available. Fodder and fruit species are scarce in PF because they have lower survival rates. Only recently have villagers' preference been considered.

Gainchi, kantii, kuto-kodalo, and picks are used for pitting. This is done in the pre-monsoon period and is followed by planting. There has been a shortage of laborers to transport seedlings from the nursery to the site. During the monsoon most people are engaged in farm work (rice cropping). The naike had to carry the seedlings himself.

Newly planted seedlings are susceptible to damage in several ways. To prevent the suppression of seedlings by weeds and grasses, an effort has to be made to remove the latter to within a radius of one meter of the seedlings. This effort has not been made in most cases. People realize the construction of a fireline would protect the plants but no action has been taken. The risk of fire is greatly reduced by the hand-cutting of the grass which is given to stall-fed animals. Insects and wild animals also do damage. Insecticides are needed.

Seedlings raised in polypots (polythene pots) are transported to the plantations without being removed from the pots. The pots are taken away only at planting time. The planting is done at the beginning of the monsoon and many of these plants survive.

Bare root planting is done by removing the polythene pots at the nursery, which is usually done if the plantation is far away. Polypot plants are heavy and therefore difficult to carry. Bare root plants are lighter because the polypot and clay are removed from the root. However, many of these plants die. Table 1 shows the number of seedlings raised in Private Plantation (PP) and Panchayat Forests (PF).

Table 1. Seedling Data

Seedlings	1980/81	81/82	82/83	83/84	84/85
Number Raised	25,000	38,200	31,139	25,260	25,000
Distribution to PP	9000	7486	8000	8560	-
Planted in PF	15,680	30,354	23,139	16,700	-

Note: 1. PPF had yet to be established.
2. Numbers of seedlings planted in PF include replanted ones.

Source: Nursery Records

Table 2. Panchayat Forest Area

PF Area (Ha)	1980/81	1981/82	1982/83	1983/84	1984/85
Planted	9.8	5	14.5	15	-
Demarcated	9.8	-	-	-	-
Handed Over	9.8	5	14.5	15	-

Note: 1. Demarcation was not made after 1980/81.
 2. PF planting area in 1981/82 is recorded at 4.5 ha, but this seems unreliable at 1600 plants per ha.

Table 3. Panchayat Forest Handed Over to Lekhnath Panchayat

Year	Land (Ha)	Ward No.	Name of PF
1981/82	9.8	1	Purunkunako Bhir
1984/85	25.0	6	Dihigaira Patan
	10.0	6	Jukekuna (Arghaun Besi)
	25.0	4	Bhetteri Thadokhori
	15.0	6	Khatredo Bhir Pakho
	15.0	8	Bajayapur Dil Bhir
	25.0	3	Kipat Tin Tarako Dil
	2.5	3	Bhir Kholsi
	12.5	2	Kipat Kalimati Bhir Dil
Total	139.8		

Note: Some PF was given to the panchayat without new plants due to the existence of old plants.

Source: Nursery Records

THE FOREST

Demarcation

In 1981/82, 9.8 ha of land were demarcated at Purunkunalo Bhir (Table 2). Due to lack of budgeting, physical demarcation was not begun.

Panchayat Forest

Features of PF are:

- plantation on bare land;
- forests are handed over to village panchayats (Table 3), with the responsibility to replant, protect, and manage them;
- panchayat obtains 75 percent and Forest Department 25 percent of the royalties from the forest with the right to spend them as appropriate.

Panchayat Protected Forest (PPF)

The PPF in the region will be handed over to LP which will then be responsible for growing and protecting the plants.

Forest Management Plan

A management plan has not yet been made in LP. Recently, guidelines for plans for PF and PPF were prepared. The Chief Forest Adviser should be fully acquainted with recording processes. Further, training should be provided to the naike and heralu, because they are the main sources of information in the field.

Table 4. Plantation and Survival Records

Species	Planted (No.)	Survival Rate	
		Nov 1981 (%)	March 1982 (%)
Schima wallichii	3500	65	18
Ficus roxburghii	2000	60	9
Alnus nepalensis	2750	16	5
Ficus simicordata	2200	55	37
Prunus cerasoide	250	71	60
Cedrela toona	550	72	50
Fraxinus floribunda	500	65	45
Bassia butyracea	1000	72	57
Michelia champca	1000	80	48
Others	2250	-	-
Total	16,000	53	37
Sample Number		588	980
Sample % of total		3.7	6.1

Source: Nursery Records

PLANTATION SURVIVAL

Merely planting seedlings will not give the desired result. They must survive. Plantation and survival records are inadequate. Although a plantation register was begun, it is not properly maintained. Available data on seedling survival is given in Table 4. The survival rate of Michelia champca is the highest, and the rate of Alnus nepalensis the lowest.

In March, the seedlings are damaged by fire, hailstones, or livestock. The remaining are harvested in December, and the animals are left free to graze, even in PF. The livestock carefully select the palatable species and so few of them grow beyond the seedling stage.

In the absence of a plan which shows which species have been planted, estimating survival rates was difficult. Field counting was done at random in January and February 1985, with the help of the naike and heralu. The count revealed a drastic difference in rates compared to any records that had been kept (Table 5). The strongest species was found to be Populus deltoide and the weakest, Callistemon lanceolatus. In recent years, more plants have survived due mainly to the use of chemical insecticides and more controls on grazing.

A sample survey on the survival rates of bare root seedlings and polypotted seedlings was done (Table 6). A laborer can carry 800-1600 bare roots, but not more than 100 polypotted ones. Still, more of the latter survive. Bare root planting of *alnus nepalensis* is more successful at higher altitudes (for example, Sarangkot at 1400 meters). Polypot planting has succeeded even at lower altitudes.

The survival rates of PF that have been recorded by the nursery are given in Table 7. The rate depends on soil type; the 64 percent rate recorded for Jukekuna was among the highest.

Due to high mortality rates, replanting must be done annually. Most of the Purunkunakobhir land is hard and rocky. Katreko Bhir Pakho, Kihigaira Pakho, and all other PF areas have both rocky and fair soil conditions. Most of the plants are not grown in hard rock areas.

Table 5. Survival Rate of PF

Ward	PF	Species	No: Counted,	Survived	%
1	Purunkunako	<i>Schima wallichii</i>	85	46	54.1
	Bhir	<i>Dalbergia sissoo</i>	70	42	60.0
2	Kalimati	<i>Michelia champca</i>	30	11	36.6
3	Tentahara	<i>Cedrela toona</i>	20	9	45.0
6	Jukekuna	<i>Alnus nepalensis</i>	35	10	28.5
		<i>Pinus wallichiana</i>	20	7	35.0
	Khatreko	<i>Fraxinus floribunda</i>	30	19	63.3
	Bhirpakho	<i>Populus deltoide</i>	30	20	66.6
	Dihigaira	<i>Bassia butyracea</i>	30	6	20.0
		<i>Litsea polyantha</i>	30	8	26.6
		<i>Callistemon lanceolatus</i>	40	6	15.0
8	Ritthepani	<i>Ficus roxburghii</i>	40	8	20.0
Total			460	192	41.7

Table 6. Survival Rates of Bare Root and Polypot Seedlings

Species	No. Planted	Counted		Survival Rate(%)	
		No.	%	Bare root	Polypot
<i>Schima wallichii</i>	3500	44	1.3	65	-
<i>Prunus cerasoide</i>	250	28	11.2	71	-
<i>Cedrela toona</i>	550	50	9.1	72	-
<i>Ficus semicordata</i>	2200	23	1.0	55	-
<i>Michelia champca</i>	-	-	-	-	80
<i>Ficus roxburghii</i>	2000	10	0.5	60	-
<i>Alnus nepalensis</i>	2750	92	3.3	16	-
<i>Bassia butyracea</i>	-	-	-	-	72

Source: Nursery Records

PRIVATE PLANTATION

Seedlings raised in the nursery are also distributed for private planting (PP). This is becoming popular in LP where the demand for fuel-

wood, fodder, and fruit species is particularly high. Fruit tree seedlings are not grown in the nursery. *Artocarpus lakoocha*, *a. integra*, *bassia butyracea*, *alnus nepalensis*, *ficus roxburghii*, *litsea polyantua*, *michelia champace*, and *morus alba* are popular because they are good for fruit, fodder, fuelwood, and timber.

A random sample of ten households in Ward 6 was taken to determine the PP survival rate. Regardless of ethnic group, the PP survival rate (64 percent) was higher than the PF one (52 percent). Ward 3 was selected at random to examine the survival rate (average 64 percent) of the species (Table 8).

Table 7. PF Survival Rate By Plantation

Ward	PF	Area (Ha)	Year of Planting	Planted (No.)	Surviving Plants No.	Plants %
1	Purunkunako	9.8	1980/81	15600	5200	33
2	Kalimati	5.0	1981/82	8000	4800	60
3	Tentahara	5.5	1982/83	8800	5100	58
6	Ritthevani	9.0	"	14400	8200	57
6	Jukekuna	5.0	1983/84	8000	5150	64
6	Khatreko	7.6	"	12200	6200	51
6	Dihigaira	2.4	"	3840	1900	49
Total				70942	36550	52

Table 8. Species Survival Rate of PP

Species	No: Counted	Survived	%
<i>Alnus nepalensis</i>	205	138	53
<i>Melia azedarach</i>	100	56	56
<i>Shorea robusta</i>	100	58	58
<i>Artocarpus lakoocha</i>	150	87	58
<i>Ficus roxburghii</i>	32	22	68
<i>Choerospondias axillaries</i>	80	60	75
<i>Cedrela toona</i>	3	3	100
<i>Dalbergia sissoo</i>	25	22	88
<i>Artocarpus integra</i>	10	7	70
<i>Fraxinus floribunda</i>	85	54	64
Total	790	507	64

Source: Nursery Records

FACTORS AFFECTING PLANT SURVIVAL

Factors affecting PF plantation survival include:

- Defective planting method: some polypots are not removed
- Irregular weeding
- Damage by hailstones and fire (especially in February and March)

- Damage by livestock
- Hard rock and steep slopes make it difficult to plant

Factors affecting PP include:

- Damage by livestock: after crop harvesting in December, animals are allowed to graze freely in both PP and PF
- Bad weather conditions

STOVE PROGRAM

The stove program in LP was started in 1983/84. Ten days of training for one stove promoter was provided in Kathmandu, and two men were taught, in five days, how to install the new stoves. Afterwards, they began work in LP. During the field visit, the CFA retrained them. Improved stoves are produced only in LP, for distribution to all panchayats launching CFDPs (Table 9). They are provided in cases of extreme fuelwood shortage, or constant demands from the local community.

In the local communities, improved stoves are more popular than traditional stoves. This is mainly because it is smokeless, requires less fuelwood, does not blacken the cooking pots, and does not need frequent blowing to stay lit. The local people are even willing to pay for improved stoves. The problems with traditional stoves include: smoke in the house, a high consumption of fuelwood, the need for frequent ventilation leading to open and therefore dangerous fires.

Table 9. Stove Installment Records

Year	Production		Distribution		Village Panchayat	Wards
	Target	Achievement	Target	Achievement		
1983/84				110	Lekhnath	1-3, 7-9
				51	Sisuwa	1, 4, 5
				50	Rakhi	2-6, 9

Total	360	211	360	211		
1984/85				100	Lamachaur	All

Total	260	100	260	100		

Compared to the traditional stoves, the improved stoves save as much as 33 percent fuelwood, but the budget allocated by the Forest Department for them (12,230 in 1983/84) has to be supplemented.

Limitations to the improved stove supply include:

- Low financial allocation
- Few stove makers (only two people)

Stove users' problems:

- Stoves are prepared for medium-sized families (five to seven persons) and are insufficient for a family of more than seven.
- Frequent and assiduous cleaning of chimney is needed.
- One must cover second hole while using first hole.

The trained men instal the new stoves. Then each user is taught to clean and repair the chimney and other parts of the stove. A wall chart is provided to each household for additional information.

EXTENSION PROGRAM

Overall, the active involvement and interest of local people determines the success of CFDP. Well-managed and widespread extension program efforts lead to consensus and awareness among villagers. CFA and other local level staff should be encouraged to follow an approach which leads to better participation levels. Documentaries, filmstrips, extension materials, training, seminars, and village meetings would all be helpful. At present, only extension materials including school flip charts, calendars, booklets, posters, stickers, and leaflets are widely distributed. No documentaries and filmstrips have been shown.

The naike was trained for a month after the nursery was established. Recently, seven heralus have been working at the plantation following a one-week training course. Later, they were retrained frequently. Essential guidelines and training are provided by the CFA during his field visit but the heralus are illiterate and the naike finds it difficult to maintain accurate records.

The program includes a seminar with the CFA, naike, Village Forest Committee members and other relevant people participating. This program has been not effectively conducted. It should include discussion of PF rules, reports on project activities, group discussion, and field trips to the nursery and plantation sites.

Under the chairmanship of the present Upa Pradhan Pancha, a nine-member Village Forest Committee was set up. At a committee meeting held before responsibility was handed over to the PF recommendations were made and included in the management plan.

Women are responsible for most forestry-related work such as, fuel and fodder collection, cooking with firewood, and care of grazing livestock, so they are the real experts in the project area. They are the most affected by deforestation as they must now go far to collect what they need. They should be involved in the extension program.

CONCLUSIONS

- More care is given to seedling production in the nursery than to PF, but both are poorly managed.
- Due to low seed germination, some of the polypots and seedbeds have nothing to show, and due to careless planting of the PF, most of the pits have nothing to show as well.
- Records of seedling plantation and survival rates are inadequate.
- To save transport costs, seedlings are carried with their root

- unprotected, resulting in a high mortality rate.
- Plant survival does not yet seem to be a serious concern. PPF and demarcation of the forest areas have yet to be realized.
 - PPs are more popular and have a higher survival rate than PFs.
 - Plant survival rates varied according to source.
 - Supply does not meet demand for fruit and fodder species on PPs.
 - Improved stoves are preferred to traditional stoves, but are in short supply.
 - The extension program has not been properly launched. Without the active participation of the people, the project cannot succeed. The local community is still overlopping and overgrazing, now in PFs as well. The herulas are responsible for controlling deforestation but have been unsuccessful because of an absence of village cooperation. Objecting, uncooperative local people have held back the establishment of PFs in Ward No. 5, 7, and 9.
 - The naike was sincere in conducting his nursery duties, yet inefficient. The heralus were neither sincere nor efficient. They pass the time playing cards and gossiping at a small village hotel.
 - The budget is insufficient. When the money is allocated, the timing is often wrong.
 - One CFA looks after five village panchayats. All records and other fieldwork is the responsibility of a naike who is hardly literate.

RECOMMENDATIONS

Fuelwood, fodder, and timber supplies could be increased if CFDP seedlings are protected as they mature into trees.

Livestock and bad weather conditions are the main causes of seedling damage in PF and PP. Damage by livestock can be controlled with fencing made of locally available cheap materials, like bamboo and wooden sticks. PF fencing is more expensive than PP fencing because it has to surround a much larger area. To protect PF, more community cooperation is needed. Villagers can cooperate by limiting the amount of fodder they lop off the trees, and by preventing their animals from grazing freely in planted areas. Livestock, especially goats, select more palatable fodder when unbound. The best solution is to encourage more stall feeding. To do this, more improved grasses and legumes should be grown near unproductive land. Only a little time and effort would be required to transport the grass. Animal housing can be made at a low cost with bamboo and thatch. CFDP should provide seedlings of improved grasses and legumes according to household need.

There are not enough communication and training media; posters, leaflets, charts, filmstrips, and documentaries emphasize the importance of the forest resource and the need for its protection. This might help to raise village consciousness of project activities and to start voluntary participation in PP preparation, weeding, fire prevention, and demarcating CFDP forests.

Periodically, village meetings should be held and women should be involved. They should be included in extension activities because they are the most directly responsible for forestry-related work.

APPENDIX

Seedlings Raised in LP-CFDP Nursery (1984/85)

Local Name	Botanical Name	Use
Chilaune	<i>Schima wallichii</i>	Timber, fuelwood
Paingyo	<i>Prunus cerasoide</i>	Fuelwood, fodder, timber
Tooni	<i>Cedrela toona</i>	Timber, dye, furniture, fodder, medicine
Champ	<i>Michelia champca</i>	Timber, ornamental
Sissoo	<i>Dalbergia sissoo</i>	Timber, fodder, medicine, furniture
Nebharo	<i>Ficus roxburghii</i>	Fodder, fruit
Utis	<i>Alnus nepalensis</i>	Timber, fodder, fuel, tanning
Gobre Salla	<i>Pinus wallichiana</i>	Timber, resin, fuel, torches
Lankuri	<i>Fraxinus floribunda</i>	Fuelwood, fodder, timber
Lahare Pipal	<i>Populus deltoide</i>	Paper, ornamental
Chiuri	<i>Bassia butyracea</i>	Fruit, timber, fodder, soap
Kutmiro	<i>Litsea polyantha</i>	Fodder, medicine
Kalki	<i>Callistemon lanceolatus</i>	Ornamental
Aulo Salla	<i>Pinus roxburghii</i>	Timber, resin, fuel, medicine
Dar	<i>Boehmeria regulosa</i>	Wooden utensils
Pakhure	<i>Ficus gleberrima</i>	Fodder
Petula Salla	<i>Pinus patula</i>	Timber, resin, fuel
Badahar	<i>Artocarpus lakoocha</i>	Timber, fuelwood, fodder, fruit
Katahar	<i>Artocarpus integra</i>	Fruit, dye, fodder
Bans	<i>Dendrocalarnus strictus</i>	Poles, walls, furniture, fodder, pulp
Jacyanda	<i>Jacayanda acutifilia</i>	Ornamental
Kangiyo	<i>Gravillea robusta</i>	Fuelwood, ornamental, furniture
Ipil	<i>Leucena leucocephala</i>	Fuelwood, pole, fodder, ornamental
Kimbu	<i>Morus alba</i>	Fruit, fodder
Rittha	<i>Sappindus mukoressi</i>	Soap, fuelwood
Masala	<i>Eucaliptus camuldensis</i>	Fuelwood, fodder, timber
Siris	<i>Albizia lebbeck</i>	Timber
Dhoopi Salla	<i>Cupressus Sp.</i>	Ornamental, fuel
Supari	<i>Areca catechu</i>	Medicine, animal mastication
Bakaino	<i>Melia azedarach</i>	Fuelwood
Sal	<i>Shorea robusta</i>	Timber, fuel, resin, oil, fodder
Tanki	<i>Bauhinia purpurea</i>	Fuelwood, fodder, timber
Tinju	<i>Dyaspyros Sp.</i>	Fuelwood, fodder, timber
Phaledo	<i>Erythrina arborescens</i>	Fodder, fuelwood, timber
Lapsi	<i>Choerospondias oxillaris</i>	Fruit, fuelwood, timber

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