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PROJECT

PROJECT NUMBER 367-0132

VOLUME II (B) . . . . . APPENDICES E-H

APPENDIX E - FORESTRY MANAGEMENT REPORT

APPENDIX F - ENERGY AND RELATED ACTIVITIES

APPENDIX G - IRRIGATION COMPONENT

APPENDIX H - WATER SUPPLY COMPONENT

APPENDIX E

FORESTRY MANAGEMENT REPORT

Prepared by: APROSC

TABLE OF CONTENTS

	Page
Summary: Implementation Scope for RCUP Forestry Component	1
Forestry Measures Required to Fulfill Objectives	1
Basic Implementation Requirement	2
Implementation Procedure	3
Community Plantings	4
Panchayat Forests	4
Panchayat-Protected Forests	5
National Forests	5
Private, Leasehold or Contract Forests	6
Watersheds or Community-Water Supplies	7
Forestry Activity Labor Potential	8
Seed Collection	8
Panchayat Nurseries	8
National Forest Nurseries	8
Planting Crews	9
Fire Suppression	9
Private Forest Workers	10
Logging	10
Sawmilling	10
Forest Implement Supplier	11
Labor Supply	11
Figure 1	12
Introduction	13
Objectives	14
Project Area	15
Topography	15
Climate	16
Geology And Soil	17
Vegetation	17
Land Use	18
Table 1	18
Table 2	19
Table 3	20

TABLE OF CONTENTS

(Continued)

	Page
Table 4	21
Table 5	21
Population	22
Table 6	22
Table 7	23
Communication	23
Existing Production and Consumption of Forest Produce	23
Table 8	24
Table 9	24
The Project	25
Forest Demarcation	25
Table 10	26
Table 11	28
Nursery Establishment	28
Table 12	29
Establishment of Panchayat Forests	29
Table 13	30
Establishment of Panchayat-Protected Forests	31
Table 14	31
Community of Individual Planting	32
Table 15	32
National Plantation Establishment	32
Table 16	33
Species and Provenance Trials	33
Table 17	34
Preparation and Implementation of Management Plan	34
Table 18	34
Extension and Training	35
Table 19	35
Construction of Buildings	35
Table 20	36
Purchase of Equipment and Vehicles	36

TABLE OF CONTENTS

(Continued)

	Page
Demonstration Sawmills	36
Charcoal Pilot Study and Aerial Seeding	36
Private and leased Forests	36
Cost Estimate	37
Table 21	38
Organization and Management	39
Table 22	41
Production Markest and Prices	
Production	41
A. Fodder and Forage	42
B. Fuelwood and Timber	43
Table 23	44
Market Prices	48
Economic Benefits	
Increased Production	48
Table 24	50
Unquantifiable Benefits	51
Employment	51
Table 25	52
Economic Rate of Return	52

Attachment 1

Table 1-a	Land Use by Panchayat 1979	53
Table 2-a	Forest by Altitude Area in Hectare	54
Table 3-a	Present and Projected Land Use by Panchayat	55
Table 1-b	Land use of Panchayat 1979	56
Table 2-b	Forest by Altitude Area in Hectare	57
Table 3-b	Present and Projected Land Use by Panchayats	58
Table 1-c	Land Use by Panchayat 1979	61
Table 2-c	Forest by Altitude Area in Hectare	62
Table 3-c	Present and Projected Land Use by Panchayat	63

TABLE OF CONTENTS

(Continued)

		Page
Attachment 1		
Table 1-d	Land Use by Panchayat 1979	65
Table 2-d	Forest by Altitude Area in Hectare	66
Table 3-d	Present and Projected Land Use by Panchayat	67
Attachment 2		
Table 1-a	Wood Volume in '000 Cu. M	68
Table 1-b	Wood Volume in '000 Cu. M	69
Table 1-c	Volume in '000 Cu.M./Elevation	70
Table 1-d	Wood Volume in '000 Cu. M	71
Table 2-a	Supply & Demand of Wood	72
Table 2-b	Supply & Demand of Wood	73
Table 2-c	Supply & Demand of Wood	74
Table 2-d	Supply & Demand of Wood	75
Attachment 3		
Table 1-a	Forestry Component Summary of Activities	76
Table 1-b	Forestry Component Summary of Activities	77
Table 1-c	Forestry Component Summary of Activities	78
Table 1-d	Forestry Component Summary of Activities	79
Attachment 4		
Determination of Nursery Size		80
Attachment 5		
Nursery Information on Recommended Species		81
Attachment 6		
Recommended Species for Plantation		84
Attachment 7		
Exotic Species		95
Attachment 8		
Building Specification		96
Attachment 9		
List of Equipment		98

TABLE OF CONTENTS

(Continued)

Page

Attachment 10

Table 1-1 Nursery Establishment Programme 99

Table 1-2 Nursery Establishment Schedule 100

Table 1-3 Nursery Establishment Schedule 101

Table 1-4 Nursery Establishment Programme 102

Table 2a-1 Panchayat Plantation Establishment Scedule Fuelwood/Fodder . 103

Table 2a-2 Plantation Establishment Schedule in Panchayat Forest Fuelwood/Fodder 104

Table 2a-3 Plot Establishment Schedule in Panchayat Forest Fuelwood/Fodder 105

Table 2a-4 Panchayat Plantation Establishment Schedule Fuelwood/Fodder . 106

Table 2b-1 Weeding Schedule Panchayat Forest in Hectare 107

Table 2b-2 Weeding Schedule in Ha. Panchayat Forest 108

Table 2b-3 Weeding Schedule in Ha. Fuelwood/Fodder 109

Table 2b-4 Weeding Schedule in Ha. Panchayat Forest Fuelwood/Fodder . . 110

Table 2c-1 Casualty Replacement Panchayat Forest Plantation Fuelwood-Fodder Area in Ha 111

Table 2c-2 Casualty Replacement Panchayat Forest Plantation Fuelwood/Fodder 112

Table 2c-3 Casualty Replacement Panchayat Forest Plantation 113

Table 2c-4 Casualty Replacement Panchayat Forest 114

Table 2d-1 Thinning in Panchayat Forest (Fuelwood Plantation) in Ha . . 115

Table 2d-2 Thinning in Panchayat Forest (Fuelwood Plantation) in Ha . . 116

Table 2d-3 Thinning in Panchayat Forest (Fuelwood) 117

Table 2d-4 Thinning in Panchayat Forest (Fuelwood) 118

Table 3-1 Panchayat Protected Forest Establishment 119

Table 3-2 Panchayat Protected Forest Establishment 120

Table 3-3 Panchayat Protected Forest Establishment Schedule 121

Table 3-4 Panchayat Protected Forest Establishment 122

Table 4-1 Community Planting No. of Seedlings in '000 123

Table 4-2 Community planting No. of Seedlings in '000 123

TABLE OF CONTENTS

(Continued)

Page

Attachment 10

Table 4-3 Community Planting No. of Seedlings in '000 124

Table 4-4 Community Planting No. of Seedlings in '000 124

Table 5-1 Species and Prominence Trail Plots 125

Table 5-2 Species and Prominence Trail Plots 125

Table 5-3 Species and Prominence Trail Plots 126

Table 5-4 Species and Prominence Trail Plots 126

Table 6-1 Demarcation Program Length in Km 127

Table 6-2 Demarcation Program Length in Km 128

Table 6-3 Demarcation Program Length in Km 129

Table 6-4 Demarcation Program Length in Km 130

Table 7a-1 National Plantation Target (Ha.) 131

Table 7a-2 National Plantation Target (Ha.) 132

Table 7a-3 National Plantation Target (Ha.) 133

Table 7a-4 National Plantation Target (Ha.) 134

Table 7b-1 Weeding Schedule National Plantation in Ha 135

Table 7b-2 Weeding Schedule National Plantation 136

Table 7b-3 Weeding Schedule National Plantation in Ha 137

Table 7b-4 Weeding Scedule in Ha. National Plantation 138

Table 7c-1 Casualty Replacement in National Plantation 139

Table 7c-2 Casualty Replacement in National Plantation 140

Table 7c-3 Casualty Replacement in National Plantation 141

Table 7c-4 Casualty Replacement in National Plantation 142

Table 7d-1 Thinning in National Plantation in Ha 143

Table 7d-2 Thinning in National Plantation in Ha 144

Table 7d-3 Thinning in National Plantation in Ha 145

Table 7d-4 Thinning in National Plantation in Ha 146

Table 8a-1 Preparation of Management Plan of Panchayat Protected Forest in Ha 147

Table 8a-2 Preparation of Management Plan of Panchayat Protected Forest in Ha 148

Table 8a-3 Preparation of Management Plan of Panchayat Protected Forest in Ha 149

TABLE OF CONTENTS

(Continued)

Page

Attachment 10

Table 8a-4 Preparation of Management Plan of Panchayat Protected Forests in Ha 150

Table 8b-1 Implementation of Management Plan 151

Table 8b-2 Implementation of Management Plan 152

Table 8b-3 Implementation of Management Plan 153

Table 8b-4 Implementation of Management Plan 154

Attachment 11

Table 1-a Central Nursery 155

Table 1-b Panchayat Nursery 156

Table 2-a Panchayat Forest Establishment (Fuelwood) 157

Table 2-b Panchayat Forest Establishment Cost (Fodder) 158

Table 3 Forest Demarcation 159

Table 4 Trial Plots 160

Table 5 National Plantation Establishment Cost 161

Table 6 Thinning Per Ha 162

Table 8 Management Plan 163

Attachment 12

Table 1-a Kulekhani Catchment (Capital Cost) 164

Table 1-b Daraundi Catchment (Capital Cost) 166

Table 1-c Myagdi Catchment (Capital Cost) 169

Table 1-d Mustang Catchment (Capital Cost) 171

Table 2-a Kulekhani Catchment (Capital Cost) 173

Table 2-b Daraundi Catchment (Capital Cost) 175

Table 2-c Myagdi Catchment (Capital Cost) 177

Table 2-d Mustang Catchment (Capital Cost) 180

Table 3-a Foreign Exchange 182

Table 3-b Foreign Exchange 184

Table 3-c Foreign Exchange 186

Table 3-d Foreign Exchange 188

Table 4-a Voluntary-Labor-Cost 190

Table 4-b Voluntary-Labor-Cost 191

TABLE OF CONTENTS

(Continued)

	Page
Attachment 12	
Table 4-c Voluntary-Labor-Cost	192
Table 4-d Voluntary-Labor-Cost	193
Attachment 13	
Table 2-a Staff Cost	194
Table 2-b Staff Cost	195
Table 2-c Staff Cost	196
Table 2-d Staff Cost	197
Attachment 14	
Table 1-a Phasing of Staff	198
Table 1-b Phasing of Staff	199
Table 1-c Phasing of Staff	200
Table 1-d Phasing of Staff	201
Attachment 15	202

Summary: Implementation Scope for RCUP Forestry Component

The primary objective in the forestry component of the RCUP is to ensure a sustained future supply of firewood, fodder, building poles and timber for the rural population while at the same time reducing runoff and soil erosion. This objective can be achieved through the practice of good forest management, entailing:

1. Extension work with rural hill residents to accomplish the transfer of forest management techniques that have been proven to be applicable in Nepal and which answer local needs;
2. Development of an appreciation of the various types of benefits produced by good forest management at both the local and national level;
3. Development of an action plan aimed at increasing yields of forest products to meet projected demands, and sustaining those yields indefinitely;
4. Research and pilot projects to learn the best management techniques for mature hill forests, and for exotic and indigenous species potentially adaptable to Nepalese needs and conditions.

Forestry Measures Required to Fulfill Objectives

The forestry component of the Resource Conservation and Utilization Project (RCUP) should combine reforestation efforts with improved management of existing forest stock within the selected catchments. Multiple-use management principles are to be employed. Interrelated measures will include:

1. Planting of 734,000 trees in the immediate vicinity of people's homes, places of work, and routes of travel, with the idea of making forestry a part of daily living;
2. Reforestation and/or revegetation on 12,890 ha of eroded or degraded areas to reduce surface water flow and build soil fertility;
3. Forestation of designated panchayat and national forests as sources of firewood, fodder, and saw timber on 12,618 ha;
4. Improvement of watershed management on 86,004 ha;

5. Inventory of forests and forest land use potentials for 75,097 ha and 3300 km of forest demarcation;
6. Establishment of an agro-forest research base to assist extension agents in serving farmers more effectively; four field research centers; 260 research trail plots and the construction of four demonstration sawmills and one presto log maker.
7. Improved management of presently unproductive forest stands on 75,097 ha of national and panchayat protected forests;
8. Carrying out preparatory forestry work such as the establishment of nurseries and training of nursery and other forestry workers gradually expanding to intensive forest work applications (thinning, logging, etc.) as forest volumes increases, establishment of 46 nurseries, management plan implementation of 73,114 ha, 42 working schemes for panchayat forests, and establishment of 72 ha of lease forest and 200 ha of private forests;
9. Training of 77 nursery workers, out-of-country training of 32 professional foresters, and training of sawmill research assistants and other forestry workers;
10. Construction of 112 buildings to house and office the decentralized field staff.

Every attempt is to be made when designing the forestry projects that forestry supports local community development by contributing to agriculture watershed management, fuel and fodder production, and other conservation practices. These efforts must be coordinated with The National Program of Forestry for Community Development formulated by The Ministry of Forests. Forestry proposals must be made in collaboration with the watershed manager, agriculturists, energy specialist, etc. to develop a number of optional uses or harmonized mix of forest-related activities for wood-using communities, within the potential of human and land capability.

Basic Implementation Requirement

The task of initiating and maintaining an integrated community and national forestry program is not easy. However, to separate one from the

other is to the detriment of both. The success of a national forestry program depends upon the support of the communities in the vicinity of the forests. People within the communities will be asked to contribute a certain amount of labor to the effort, particularly to tree planting and tree maintenance around their homes and in forests of which they are the prime beneficiaries.

Forests, not only in Nepal but also in other countries, have been historically considered available for free use by people living adjacent to the forest. Periodically a few individuals are caught taking forest products and are reprimanded and usually given small fines. Such reprimands are short-term deterent measures to continued taking of forest products without permission. The long-term effect of this measure is to establish a sense of nontrust when government workers suggest that the community become involved in a forestry program, particularly when the involvement request centers around free labor to plant what has historically been considered nationalized forests.

People are normally unwilling to take the risk of providing "free services" on a national project that should be, for all intents and purposes, nationally funded. They have a fear of not gaining any benefit, and because forestry is a long-term input, this fear or reluctance to get involved becomes too great to be overcome in the short term. Further, people cannot afford to take their time away from a quick-return activity such as agriculture. Unless motivation is high, free labor to a forest activity is often thought of as frivolous and an exploitation of people's energies.

Therefore, the primary step of community involvement is to ensure that local farmers and other residents receive sufficient wood and supporting resources so that labor input, either donated or salaried, to both the community forest and national forest programs is both attractive and meaningful.

Implementation Procedure

The implementation of the integrated forestry plan rests mainly with the people. Motivation and direct participation will be the most important roles of the action plan for the forestry program and these elements prescribe the procedure for effective management. The following forest categories will be used to initiate a phased multipurposed program using the community as the focal point.

Community Plantings. The first step in launching an effective community-based forestry project is to gain the genuine support of the farmers and local residents. The highest priority during the first stages is to implement forestry work in or near areas of immediate labor availability. This phase is intended to instill in the people's minds that forestry is an integral part of community life--a concern for the care of trees.

Under this category, emphasis will be given to planting trees (combinations of fuel, fodder, and fruit species) around houses and villages, along roads, along irrigation ditches, on suitable terrace bunds, and along streams and rivers. A nursery will be established in each panchayat to furnish planting stock. Technical assistance, equipment, and training of local workers will be furnished by the project. The trees will be given free to the farmers and residents for them to plant. Advice on planting and maintenance will be given to the people and followup provided in terms of visits as the project extension staff visit the communities. It may either be necessary to replace damaged trees or change species as a result of this followup.

Because the nuseries will serve more than one category of forest, the workers in the nurseries will be paid by the project.

Panchayat Forests. As in the Panchayat Forest Rules--1978, this category of forest can be established "for the purpose of developing forests through reforestation on any government forest or part thereof which has been rendered waste, or in which only stray trees are left . . . ." Within the context of developing a forest management plan for each RCUP area, locations will be identified where such forests can be established. While the principal purpose of the 1978 law is to establish new forests, the inventory to be conducted in identifying locations may assess the possibility of reforestation around several small isolated patches of existing forest. The existing forest would serve as a future seed source and give some hint of suitable species for reforestation.

Because the main beneficiaries are the people themselves, the actual planting of treeless areas is to be done with contributed labor. The community will be expected to designate workers who are to be trained in jobs dealing with maintenance and protection of the forest. Each nursery may employ as

many as five people. As many as 10 salaried forest workers may find jobs in the panchayat forests. The project will provide for the nursery stock, planting equipment, and advisory services. The panchayat forest workers will be expected to be paid from the revenue derived from a community-imposed tax that covers the maintenance/management of the forest. However, it may be necessary for the project to supplement the worker salaries until the forest matures enough to begin producing products that are salable.

Due to the need of inventorying, demarcating and preparing the designated lands, actual panchayat planting may not take place for two to three years after the RCUP starts. During this two to three years community plantings will be carried out, and development of the panchayat forests will benefit from the people's understanding built up by the community planting activities. It should be expected that planting stock can be furnished by the panchayat nursery initially established to produce community planting stock.

Panchayat-Protected Forests. According to the official designation, these forests are portions of existing forests earmarked for panchayat use. These forests are also to be managed and protected by the local community in which they are established. There probably will be some minor inter-planting needed, the seedlings for which can come from the panchayat nursery.

The RCUP, with the Department of Forests, will assist the community in identifying areas to be designated panchayat forest, and will train the forest workers on mangement of the forest and provide continuous technical advice. It probably will take two to three years for panchayat forests to be designated and demarcated, management plans prepared, and people trained to manage them. The project should anticipate subsidizing all training costs, including a stipend to the trainees.

National Forests. These lands will be demarcated according to the rules and regulations of The Ministry of Forests. National forests will be located on lands capable of producing such forests but will not conflict with the need for people to grow crops. Such forests will be managed on the multiple-use principle.

National Forest Lands will be made up mainly of existing forests, treeless areas to be reforested, and grassland areas to serve as grazing lands. Management will be under national direction for many products such as saw timber, pulp for paper manufacturing, fuel, fodder, water yield, watershed protection, recreation and wildlife.

Immediate priority should be given to establishing such forests near communities that have a real shortage of wood in order to contribute to crucial firewood supplies. The management plan for each area (larger than the panchayat) should pay special attention to managing existing forests so that community firewood needs can be met while protecting the regenerative capacity of the forests. It is assumed that as other categories of forest become established and capable of contributing to community needs, management of national forests can be phased over to meeting national needs.

For national forests the RCUP will inventory, demarcate, train forest workers, and establish nurseries primarily to meet national objectives. Except for free labor voluntarily contributed by the communities on special occasions, all labor services are to be paid.

Two types of nurseries may be built. Since the tree species planted on national forests probably will be different from those intended to meet community needs (i.e., pines and oaks rather than legumes and poplars), several permanent national forest nurseries should be established in each project area. These will be larger and more sophisticated than the panchayat nurseries and, while not directly related to furnishing planting stock for communities, they would represent a backup emergency supplier upon request and a training ground for workers. Satellite or temporary murseries will be established in areas where a large amount of planting is needed. These will only be used for two to three years and then abandoned.

Private, Leasehold or Contract Forests. Provision is made under The Ministry of Forests' rules and regulations to establish forests that can be managed under contract to individuals and organizations. As permission to establish these is given to individuals and organizations, the project will provide technical advice on establishment and management. As the people become more knowledgeable about forestry, a high degree of emphasis should be placed on directing efforts to establish this category. This kind of effort could become a major opportunity in addressing the question of what to do with highly sloping deforested land that is presently being farmed. Because these lands are occupied by the poorest of the poor, the RCUP will have to explore innovative arrangements such as group credit or loans.

Seedlings required for planting on these lands will be paid for by the "owners." These plants could come from the panchayat or national forest nurseries, providing one source of revenue.

Watersheds or Community-Water Supplies. This category includes areas that provide water for a community water supply or what should be designated as a supply. The primary management objective is to protect both the quantity and quality of water. These areas will be identified earliest in the project and receive the highest priority (together with community plantings) in the project's forest management plan. While the major aim is to protect water supplies, certain wood products, such as fuel, fodder and timber, can also be harvested from watersheds, as long as harvesting does not harm water supplies.

All the efforts and actions required to fulfill the primary objectives will require research. Assistance and encouragement will be given to both the research section of The Ministry of Forests and The Institute of Natural Renewable Resources to use the RCUP areas as a working research laboratory. Provision should be made in the RCUP to financially assist with (but not limited to) the following:

1. Test applicability of aerially seeding national forests, range lands and landslides with trees, shrubs and grasses;
2. Construct greenhouses at The Institute of Natural Renewable Resources and establish field research centers for use by the faculty and students;
3. Test the use of water-powered sawmills for both wood preparation and electricity;
4. Test use of "presto log" maker to utilize unused sawdust.

This outline of a RCUP forestry action plan emphasizes the full use of all forest products by pulling together the need for community and national forests. It relies on the responsiveness of the communities and makes voluntary labor contribution more politically, socially and economically attractive. RCUP wants to make the most effective use of village counterpart resources. It sets the process in motion that will result in developing sources of village income alternatives to agriculture. It combines management of existing forest resources with planned reforestation for the greatest benefit of all--locally as well as nationally.

Forestry Activity Labor Potential

The main goal of the RCUP is the protection and restoration of the soil, water, and plant resource base upon which the rural population is totally dependent. In Nepal this dependency has resulted in an unprecedented degree of environmental degradation caused by a spiraling growth in population attempting to make a living from a static land base which, in the main, is not suitable for intensive agriculture. In order to relieve this pressure on the land, it is most important to develop employment opportunities that either provide a supplementary income to farmers or off-the-farm employment opportunities.

There will certainly be a lag period in the acceptance of forest-related work as an alternative source of income, but ultimately it is anticipated that this type of work will gain a high degree of acceptability. The following are some work activities that can be developed during project implementation. As the project evolves, other opportunities will no doubt be identified.

1. Seed Collection: Most plant species to be used will be indigenous to Nepal. Local people can be instructed on the techniques of collecting and caring for seeds and cuttings to ensure quality control. Gathering seeds and cuttings is supplementary work, not full-time, during the seed-producing season.

   It is estimated that 10 people per project area could gain supplementary income per year collecting seeds and cuttings.

2. Panchayat Nurseries: This activity has the opportunity for both full-time and part-time work. As explained elsewhere, it is anticipated that financial support for these nurseries will come from generated income of the panchayat forests and private forest products.

   Basic Labor Requirement Per Nursery Are:

   Manager/Supervisor 1
   Laborers 4
   Seasonal 6

3. National Forest Nurseries: These nurseries will be two to 10 times the size of the panchayat nurseries. There will be at least one National Forest Nursery per project area, supported by satellite nurseries.

Basic Labor Requirements Per Nursery Are:

A. Central Nursery

Nursery Superintendent	1
Foreman	2
Laborers	10
Seasonal (Part-time).	20

B. Satellite Nursery

Manager	1
Foreman	1
Laborers	4
Seasonal (Part-time)	6

4. Planting Crews: When planting is to be done in such areas as community plantings and panchayat forests, and where the identified direct beneficiaries are the local people, it is expected that the actual planting will be done by contributed labor. In the case of national forests and private forests, planting will be done by a paid "professional" planting crew.

Labor Requirements Are As Follows:

Planting Supervisor	1
Foreman	3
Laborers	9

The number of crews per RCUP area will depend upon the magnitude of the job.

5. Fire Suppression: A major concern to be addressed is how to stop the historic pattern of burning of the forest and range cover.

Of all the forestry activities, control of burning will be the most difficult. Assuming that an information-education program will have an effect on reducing set fires, there is an opportunity to supplement incomes by paying to put out fires. However, it must be borne in mind that there is a potential of having fires deliberately set for the purpose of receiving pay. Nonetheless, the RCUP should explore this opportunity. No matter which approach is taken to reduce man-caused fires, a reward-fine system must be discussed with the communities. Fire control relies heavily on community participation.

A Basic Fire Crew Consists Of:

Crew boss	1
Squad Foreman	3
Laborers	21

The number of crews depends upon the size of the fire. The managing of putting out the fire is the responsibility of a fire management professional, usually the District Forestry Officer.

6. Private Forest Workers: Until private individuals with sufficient capital begin to recognize the benefits of forestry by witnessing RCUP national- and community-forest activities, the private forestry sector is not likely to provide much employment. Eventually, however, there will be a need for workers in timber stand improvement and logging. There may also be a need for private forest consultants to help the owners with management/operations.

   The number of workers employed will depend upon the size of the forest holdings, but two workers per ha should be sufficient. (Note: The national forests and panchayat forests will also require forest workers. The labor criteria used for private forest can also be used for other forest categories.)

7. Logging: Logging of harvestable products should be done by a well-trained logging crew in order to keep disturbance to the remaining stand to the minimum. The size of the crew will depend upon the tree sizes to be cut and transportation distance to the mill.

Logging Crew:	
Fellers	2
Cleanup	1
Transportation	
With animal power	2
(one 8" x 16' log per animal)	
With all human labor . .	4

8. Sawmilling. It is anticipated that at least one sawmill (possibly water powered) per RCUP area will be constructed. On the average, each sawmill should employ at least 10-12 people.

9. Forest Implement Supplier: Many tools, such as axes, shovels and planting tools, to be used in the forestry activity can be made locally with either local or imported materials. Maintenance and repair of machinery will also be required. It is assumed that about 10 people will find their way into this kind of support work per RCUP area.

The labor requirements outlined above do not include the professional inputs needed to both administer and oversee the total forestry activity anticipated from the RCUP.

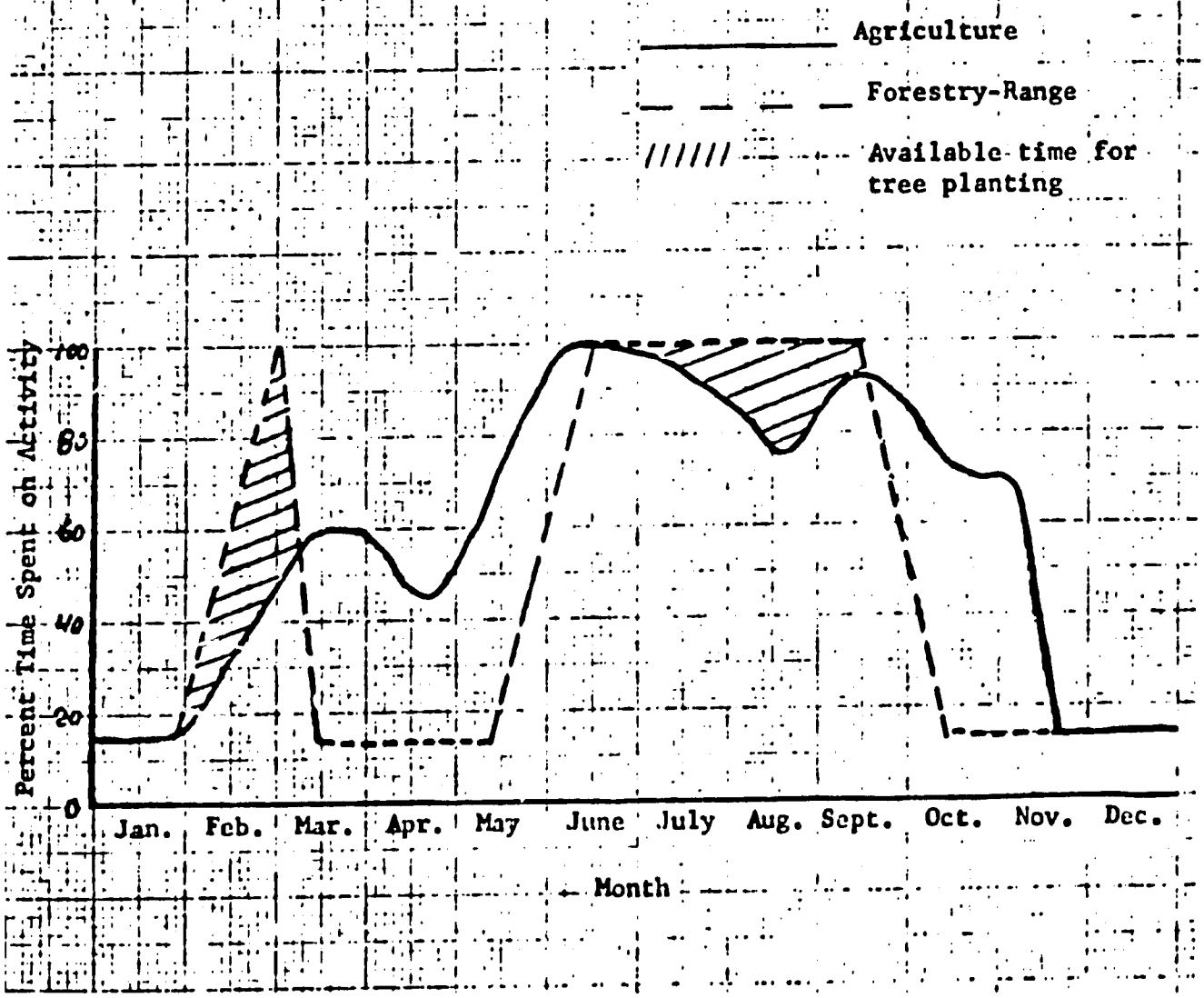
Labor Supply

Planting trees is not a full-time, labor-intensive proposition. In Nepal there are two main planting periods: (1) in early spring and (2) during the monsoon. These two planting windows also coincide approximately with the times when agricultural labor is at its peak. Figure 1 shows the percentage of labor availability to plant forest-range land at various times. The hatched areas indicate labor not used on the farm which might be available for tree planting during peak agricultural labor periods. The figures suggest that during the first planting in February-March, it would be possible to employ many people for up to a week or two, but that during the monsoon period these people would only be available for one or two days at a time. In other words, the planting of extensive national forest areas cannot depend upon contributed labor since labor availability is agriculturally work-controlled. This supports the need to train planting crews that are reliable and have the capability to carry on with the main planting job.

Figure 1 is a general summary of the agricultural labor calendar in mountainous Nepal. Individual areas may have different patterns. Figure 1 strongly suggests that good planning is required in order to fulfill the objective of developing a forest management plan that interrelates with measures outlined earlier in this paper.

A word on wage rates: the RCUP must not have a separate wage scale for women and children. The project must establish a wage-rate scale for all jobs whether they are filled by women, children or men. In this way the project will be more assured of quality work.

Figure 1.—Showing approximate periods and percentage of time Farmers spend on Agriculture work and also when main Forest-range planting can be conducted.



Introduction

Nearly sixty percent of the population of Nepal live in the hills on 35 percent of the country's arable land. The acute land pressure has resulted in reduced crop yields, increased land slides and floods, sedimentation in streams and reservoirs, and reduction of available natural resources.

People of the hill region rely heavily on forests for fuel, animal fodder, manure, poles, timbers, medicinal herbs and shrubs, and other such products. The supply of these products for the growing population has brought a tremendous pressure on the forest resources as a result of which the forest is rapidly disappearing.

The forests of Nepal in 1964 were estimated to be 45 percent of the total land area. Nearly three-fourths of this forest lies in the hill region. It is a general belief that the forest area has considerably decreased in the course of the past fifteen years.

To combat the situation, The National Forestry Plan of 1976 mandated the creation and development of new forests as well as scientific management of existing forests. The new legislation on panchayat forests, panchayat-protected forests, lease forests and private forests provides the legal frame for developing new forests with the cooperation and full participation of local communities and private individuals.

The long-term goals of the forestry component of The Resource Conservation and Utilization Project (RCUP) are to halt forest degradation, upgrade the existing forest resources to sustained high levels through scientific management, and reduce human pressure on existing forests by creating new sources of forest products. While designing the forestry component, attention has been paid to make forestry support local community development by contributing to agricultural production, fuelwood and fodder production, and better hydrologic conditions in the watersheds.

The forestry component of RCUP covers forest development aspects such as creation of new forests in the form of panchayat forests, private forests, lease forests and national plantations; identification of better species for planting; development and management of existing forests in the form of panchayat-protected forests and national forests; improvement in wood conversion and utilization; and development of practical skills of the forestry staff.

The following report treats these aspects of the forestry component of the RCUP in more detail.

Objectives

The main objectives of the forestry component of The Resource Conservation and Utilization Project (RCUP) are to conserve and utilize the forest resources through creation of new forest and develop approaches to wise use of forest resources following scientific management practices. The objectives can be detailed as follows:

1. To introduce scientific management of forest resources;
2. To ensure a sustained supply of forest products such as fuelwood, fodder, poles and timber;
3. To establish community forests (panchayat forests and panchayat-protected forests) through panchayat participation;
4. To encourage local people to establish fuel and fodder trees on their farmlands;
5. To integrate community-forest with national-forest development;
6. To select suitable species for plantation through species and provenance trials;
7. To educate individuals in forest preservation and utilization through publicity and training;
8. To introduce sawmills for better conversion of wood into timbers and other products;
9. To conduct pilot studies on scientific charcoal production and aerial seeding;
10. To provide building facilities for the forest-project staff; and
11. To establish a collaborative link between The Institute of Renewable Natural Resources and forestry-line agencies through research and field workshops.

The program has been designed to achieve the above objectives, with due consideration to feasible levels of manpower and other resources. These are detailed under subsequent headings.

Project Area

The project area encompasses the Kulekhani catchment in the Makwanpur District, the Daraundi catchment in the Gorkha District and the Kaligandaki catchment in the Myagdi and Mustang Districts.

Location. The Kulekhani catchment lies southwest of the Kathmandu Valley in the outer Himalayan Mountains called the Mahabharat Range. It extends over an area of 212 km^2.

The Daraundi catchment lies in north-central Nepal between the Trisuli River and the Tibetan border. It encompasses an area of 795 km^2.

The Kaligandaki catchment lies in north-central Nepal, the Mustang District containing the upper catchment and the Myagdi District the lower catchment of the Kaligandaki River. Myagdi lies in the inner Himalayas whereas Mustang falls between the inner Himalayas to the south and the Tibetan plateau to the north. The Myagdi and Mustang Districts are contiguous, with Myagdi lying due south of the Mustang region. The Myagdi district has an area of 944 km^2, whereas Mustang has 1565 km^2 (excluding six panchayats in the north).

Topography. The relief of Kulekhani increases from the Kulekhani Khola northward to the boundary ridge where altitudes exceed 2000 m. In several places, most slopes are under 25°. The altitudes in Mahabharat Lekh on the south exceed 3500 m and the mountains contain the steepest terrain of the region, most slopes exceeding 25°. The lowest relief is about 600 m. There is a rolling meadow at the top (Chitlang).

The landscape of Daraundi catchment grades from high glaciated mountains in the north to generally lower altitude but high-relief terrain southward. North of Barpak the mountains rise to altitudes of over 5000 m. Southward, average summit heights decline to under 3000 m and valley bottoms are as low as 600 m. Local relief throughout the region is high and slopes are mostly above 36°.

The terrain of Myagdi is highly dissected with altitudes extending from 835 m at Beni to over 6000 m along the peripheral divides. Everywhere, relief is great, with most slopes exceeding 35°.

Most of the region in Mustang lies above 2000 m, with the highest peak in excess of 7500 m. The terrain is rugged. Parts of the Kaligandaki lowland north of Jomsom are deserts.

Climate. The project area has a monsoon-type climate which is strongly influenced by the situation of the high mountain ranges. The climate varies from subtropical to temperate and alpine.

The average annual precipitation in Kulekhani varies from 1500 mm to 2500 mm, of which 80 percent falls during the monsoon. Winter is distinctly dry. All precipitation falls as rain except some snowfall in the highest elevations. Maximum 24-hour rainfall intensities exceeding 180 mm have been recorded during the monsoon. Mean monthly temperature varies between 5.6°C in January to 17.0°C in June. The summer mean maximum temperature reaches 23.5°C whereas the winter mean minimum temperature drops to -1.5°C (Department of Irrigation, Hydrology and Meteorology, 1977).

The mean annual precipitation in Daraundi catchment varies from 1400 mm to 1600 mm. Seventy-five percent of the precipitation falls during monsoon. Maximum 24-hour rainfall of 100-140 mm intensities have been recorded. The average January temperature is 12.4°C with the mean minimum dropping to 6.3°C. The July mean is 27.3°C, with the mean maximum being 27.3°C.

The annual precipitation in Myagdi varies between 700 mm and 1400 mm, generally increasing southward and with altitude especially on south-facing slopes. The percentage of annual precipitation during monsoon varies from 58 percent at Lete to 85 percent at Beni Bazar. On the other hand, percentage of annual precipitation in winter increases from 5 percent at Beni to 20 percent in the north. Maximum 24-hour rainfall intensity varies between 40 mm in the north and 150 mm in the south.

The annual precipitation in the Mustang valley varies from 300 mm in Mustang to 2500 mm in Marpha. Annual precipitation intensities decrease northward away from moisture sources and in the lee of the Himalayas. Annual precipitation is presumed generally to increase with altitude to some limits above which values decline. The percentage of annual precipitation that falls during monsoon varies from 85 percent at Tatopani to 50 percent northward. Precipitation during winter is less than 25 percent. Maximum 24-hour rainfall intensities vary up to 80 mm during monsoon. Areas north of and at higher

altitudes than Jomsom receive annual precipitation in the form of snow as well. At Jomsom the January mean minimum temperature drops to 2.6°C and the mean maximum temperature during July is 25°C. An extreme low of -10°C has been recorded. Frost occurs in seven months of the year.

Geology and Soil. The geology of the Kulekhani catchment is comprised of ridge-forming granites, quartzites and softer phyllite-schists. The midland to the north of Kulekhani Khola is in softer rocks, namely phyllite-schists, limestones, sandstones and slates. Soils are thin and poorly developed in Mahabharat Lekh, being forest podzols of relatively low fertility. In the lowlands and midlands, soils are deep and rich alluvials. Northward, these soils are thin and subject to erosion.

The dominant rocks in Daraundi catchment are Paleozoic sedimentary, metamorphic and igneous facies of geosynclinal origin. The soils vary from deep lateritic and subtropical podzolic in the south to forest podzols and tundra soils in the north. Soil depths vary from deep in the south and in low-gradient areas to shallow or absent on steep slopes and northward into the higher mountains.

The rocks of the Myagdi area are sedimentary, metamorphic and igneous. Soil depth depends largely on slope steepness. Broad-leaf forest soils are deep podzols which, when cleared, are easily eroded.

The majority of rocks in Mustang are sediments of Tethysian zone. Younger sediments of fluvial origin in the main valley form terraces of various ages and heights. Recent alluvium occupies the Kaligandaki River valley south of Jomsom. In the main valley, soils are relatively deep, especially on river terraces and alluvial fans. North of Jomsom, the lowland alluvial soils are coarse and winnowed of their fine fractions, mantled by wind-lag deposits. Elsewhere in the north, soils are typically stony and thin.

Vegetation. In Kulekhani catchment the lowlands bear subtropical broad-leaf forests. The uplands consist of mixed forests. However, in the lower and intermediate altitudes, the forests have been removed for crop lands and pasture. These activities are causing an upslope retreat of the forests, but ridge lines still contain relatively dense stands of forests.

Forest vegetation in Daruandi varies with altitude, ranging from subtropical broad-leaf forests in the south, through mixed forests in the middle regions to coniferous associations in the north. Except in the north, most native forests have been cleared. Scrub forests are found along the timber line. Beyond the timber line, alpine meadows prevail.

In Myagdi, native subtropical vegatation in the lower areas has been cleared except in remote areas. At the higher elevations, subtropical vegetation gives way to mixed forests which, due to remoteness, are often dense.

The best stands of forests in Mustang, mostly coniferous, are found south of Jomsom on the valley slopes. Northward, a combination of cold temperatures, high wind and low precipitation limits vegetation to steppe, tundra grasses, and low shrubs. Even these are absent in the sterile flood plain of the upper Kaligandaki valley.

Land Use. Out of the total project area of 3516 km^2, 28.2 percent of land is under pasture. The next highest percentage of land is under permanent snow (26 percent). National forests cover 23.2 percent of the total land area. Cultivated land occupies fourth place (16.3 percent) among land uses. The current and projected land use for the whole project is shown in Table 1.

Table 1

Present and Projected Land Use

Land Use	Current Use		Projected Use	
	Area km^2	Percentage	Area km^2	Percentage
Cultivated Land (Private)	571.88	16.3	538.47	15.3
Improved Pasture (Private)	0.00	--	32.80	0.9
Pasture	990.64	28.2	821.57	23.4
Panchayat Forests (Fuel/Fodder)	0.00	--	63.52	1.8
Panchayat-Protected Forests	0.00	--	140.35	4.0
National Forest	816.19	23.2	675.45	19.2

(Continued)

Table 1 (Continued)

Land Use	Current Use Area km^2	Current Use Percentage	Projected Use Area km^2	Projected Use Percentage
National Plantation	0.00	--	105.55	3.0
Permanent Snow	915.07	26.0	915.07	26.0
Exposed Rocks	189.00	5.4	189.00	5.4
Other Lands	33.07	0.9	34.07	1.0
TOTAL	3515.85	100	3515.85	100

Out of the total area of 212 km^2 in the Kulekhani catchment, 49 percent of the land is under forest. Cultivated land occupies second place, the percentage being 38.6. The following table (Table 2) shows the present and projected land use. (See Appendix Table 1a, 2a and 3a for details.)

Table 2

Present and Projected Land Use--Kulekhani

Land Use	Current Use Area km^2	Current Use Percentage	Projected Use Area km^2	Projected Use Percentage
Cultivated Land (Private)	81.90	38.6	74.99	35.4
Improved Pasture (Private)	0.00	--	6.91	3.3
Pasture	21.21	10.0	8.98	4.2
Panchayat Forests (Fuel/Fodder)	0.00	--	7.93	3.7
Panchayat-Protected Forests	0.00	--	17.50	8.3
National Forest	103.71	49.0	86.01	40.6
National Plantation	0.00	--	4.30	2.0
Permanent Snow	0.00	--	0.00	--
Exposed Rocks	0.00	--	0.00	--
Other Lands	5.04	2.4	5.24	2.5
TOTAL	211.86	100	211.86	100

The total area under Daraundi catchment is 795 km^2, of which 41.3 percent of the land is forested and 38.7 percent is cultivated. Table 3 shows the present and projected land use in this catchment. (See Appendix Table 1b, 2b and 3b for details.)

Table 3

Present and Projected Land Use--Daraundi

Land Use	Current Use		Projected Use	
	Area km^2	Percentage	Area km^2	Percentage
Cultivated Land (Private)	307.80	38.7	289.99	36.5
Improved Pasture (Private)	0.00	--	17.39	2.2
Pasture	134.98	17.0	69.22	8.7
Panchayat Forests (Fuel/Fodder)	0.00	--	28.61	3.6
Panchayat-Protected Forests	0.00	--	71.65	9.0
National Forests	328.35	41.3	256.70	32.3
National Plantation	0.00	--	37.15	4.7
Permanent Snow	6.38	0.8	6.38	0.8
Exposed Rocks	0.00	--	0.00	--
Other Lands	17.29	2.2	17.71	2.2
TOTAL	794.80	100	794.80	100

Myagdi has 31.8 percent of its total land area under forests. Unlike Kulekhani and Daraundi, pasture occupies 30.3 percent of the total area. Cultivation spreads over 15.25 percent of the total area in the region. The land use is given in Table 4. (See Appendix 1, Tables 1c, 2c and 3c for details.)

Table 4

Present and Projected Land Use--Myagdi

Land Use	Current Use Area km^2	Current Use Percentage	Projected Use Area km^2	Projected Use Percentage
Cultivated Land (Private)	143.44	15.2	135.14	14.3
Improved Pasture (Private)	0.00	--	8.11	0.9
Pasture	285.78	30.3	229.06	24.3
Panchayat Forests (Fuel/Fodder)	0.00	--	16.42	1.7
Panchayat-Protected Forests	0.00	--	31.55	3.3
National Forests	300.50	31.8	268.95	28.5
National Plantation	0.00	--	40.30	4.3
Permanent Snow	165.94	17.6	165.94	17.6
Exposed Rocks	39.62	4.2	39.62	4.2
Other Lands	8.68	0.9	8.87	0.9
TOTAL	943.96	100	943.96	100

Almost half (47.5 percent) of the land in Mustang is under permanent snow. Pasture and exposed rocks occupy 35.1 percent and 9.0 percent respectively. Forests cover an area of 5.3 percent. The following table gives the land use information. (See Appendix 1, Tables 1d, 2d and 3d for details.)

Table 5

Present and Projected Land Use--Mustang*

Land Use	Current Use Area km^2	Current Use Percentage	Projected Use Area km^2	Projected Use Percentage
Cultivated Land (Private)	38.74	2.5	38.35	2.4
Improved Pasture (Private)	0.00	--	0.39	0.0
Pasture	548.67	35.1	514.31	32.9
Panchayat Forests (Fuel/Fodder)	0.00	--	10.56	0.7

(Continued)

Table 5 (Continued)

Land Use	Current Use Area km^2	Current Use Percentage	Projected Use Area km^2	Projected Use Percentage
Panchayat-Protected Forests	0.00	--	19.65	1.3
National Forest	83.63	5.3	63.79	4.1
National Plantation	0.00	--	23.80	1.5
Permanent Snow	742.75	47.5	742.75	47.5
Exposed Rocks	149.38	9.5	149.38	9.5
Other Lands	2.06	0.1	2.25	0.1
TOTAL	1565.23	100	1565.23	100

*The above figures exclude six panchayats, as land use data are not available.

Population. In 1979 the total population of the project area was estimated to be 215,000[1/] with 42,000 households. Although population density varies considerably from one project area to the other and also with relief in the same project area, the average range is from 80 to 335 people per km^2. Table 6 shows the population by catchment.

Table 6

Population

Catchment	Population 1979[1/]	Number House-holds	Population/ Household	Habitable Area km^2 2/	Average People/km^2 of Habitable Area
Kulekhani	36,187	6,370	5.68	108.15	335
Daraundi	123,998	24,801	5.0	405.23	306
Myagdi	39,360	7,494	5.25	285.46	138
Mustang	14,957	2,971	5.03	127.05	80
TOTAL	214,502	41,636	5.15	925.89	226

1/ Based on population census 1971, C.B.S.

2/ Excludes permanent snow, exposed rocks, national forest and pasture above 3000 m.

The livestock population in the project area is estimated as below:

Table 7

Livestock Population

Kinds of Animals	Kulekhani	Daraundi	Myagdi	Mustang	Total Project Area
Buffalo	5,400	29,500	16,100	20	51,020
Cattle	17,400	81,900	24,200	5,300	128,800
Sheep	40	6,600	7,100	1,800	15,540
Goat	22,800	75,300	15,000	17,200	130,300
Yak & Nak	--	--	--	2,000	2,000
Chauri	--	--	--	1,400	1,400
Horse/Mule	--	--	200	2,300	2,500
Pig	--	1,200	50	--	1,250

TOTAL livestock unit in the project area = 126,820.

Communication. The paved Tribhuvan Highway runs south through the western part of the Kulekhani catchment. A graded dirt road connects from the highway to the Kulekhani Dam site. Another jeepable dirt road connects Dhorsing to the dam site. A jeepable dirt road from Pharping to the dam site via Phakhel is also under construction. All villages and panchayats are connected by trails.

The paved Prithivi Rajmarg, runs east-west along the southern rim of the Daraundi catchment. Another paved road connecting the Prithivi Rajmarg to Gorkha at Majhua is under construction. Sufficient trails exist to connect panchayats with one another.

Only foot trails exist in the Myagdi area for communication among villages. Trails traversing precipitous slopes are not uncommon in the region.

The old trading route from Pokhara to Tibet parallels the Kaligandaki River for much of its length. Other trails connect the villages and panchayats. Some access to the area is provided by plane and helicopter to and from Jomsom.

Existing Production and Consumption of Forest Produce

The per capita forest area varies from 0.26 ha in Daraundi catchment to 0.83 in Mustang. Although per capita forest area is reasonably high in

Myagdi and Mustang, the main role of forests in these areas is for watershed protection as the region is very mountainous and rugged. The per capita annual wood yield also ranges from 0.17 m^3 in Daraundi catchment to 0.86 m^3 in Myagdi, which is still less than the per capita demand of 1 m^3. The following table (Table 8) shows the per capita forest area, growing stock and yield. (See Appendix 1, Table 1a, 1b, 1c and 1d for details.)

Table 8

Existing Stock and Production

Catchment	Population 1979	Forest Area/ head (ha)	Growing Stock per head (cum.)	Yield/ head (cum.)
Kulekhani	36,187	.29	14.89	0.21
Daraundi	123,998	.26	10.57	0.17
Myagdi	39,360	.76	54.84	0.85
Mustang (excluding six panchayats)	10,129	.83	21.56	0.34
	209,674	0.39	20.16	0.31

Note: Per capita annual demand of wood is 1 m^3.

The overall picture of the wood situation by panchayats is shown in Table 9 below. (For details see Appendix 2, Tables 2a, 2b, 2c and 2d.)

Table 9

Wood Situation in Project Area

Catchment	Total Number of Panchayat	Panchayat Without Forest	PANCHAYAT WITH FOREST			
			Wood Surplus	WOOD DEFICIT Less Than 50%	WOOD DEFICIT More Than 50%	Total
Kulekhani	7	--	--	--	7	7
Daraundi	29	--	1	1	27	29
Myagdi	14	--	5	2	7	14
Mustang	10	1	2	2	5	9
TOTAL	60	1	8	5	46	59
PERCENTAGE	100.0	1.7	13.3	8.3	76.7	98.3

The total livestock unit in the project area is estimated to be 126,820 animals. The annual need of fodder is 1.376 metric ton (green weight) for livestock unit. Sixty-five percent of this need is met from the forest. The total need of fodder would, then, be 174.5 thousand metric tons of which 113.4 thousand metric tons would come from the forest.

The Project

This project will be the first in the area to augment the production of fuelwood, fodder, poles and timber through national plantation and community planting. This will stop further degradation of existing forests and create panchayat forests to meet the demands of the local populace.

Within a period of five years, the project would protect and manage the existing forest of 81,597 ha in the form of national forests and panchayat-protected forests. In the course of the project period of 15 years, it would create 125 ha (present ceiling of panchayat forests) of panchayat forest in each of the 60 panchayats in the project area. Within the project period, 10,555 ha of national plantation would be created in forest pasture land. Three and one half million seedlings will be distributed for planting in farmland in the course of 15 years. The project would provide equipment and tools, office and staff buildings, and local and overseas training for the staff and local people. To introduce improvements in the proper utilization of forest produce, a sawmilling and charcoal-making pilot study will be carried out. Table 10 summarizes the programs. (For details see Appendix 3, Tables 1a, 1b, 1c and 1d.)

The project will make available a total sum of 16.37 million rupees for a period of the first five years. The total cost for the project period of 15 years will be Rs. 248.42 million.

Forest Demarcation. Forest demarcation will be done in all four project areas, with the order of priority being: (1) panchayat forests, (2) panchayat-protected forests, (3) national plantation, and (4) national forest. A total of 16,400 km of forest demarcation will be completed in the course of 15 years. Table 11 shows the amount of demarcation to be done by project areas.

Table 10

Forestry Component--Summary of Activities

Particulars	Unit	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	I 5-Yr	II 5-Yr	III 5-Yr	Grand Total	Remarks
Building	No.	-	26	24	18	14	82	18	-	100	
Forest Project Office	No.	-	2	2	-	-	4	-	-	4	
Officers Quarters	No.	-	2	2	-	-	4	-	-	4	
Staff Quarters	No.	-	2	2	-	-	4	-	-	4	
Range Office	No.	-	2	2	2	-	6	-	-	6	
Ranger Quarters	No.	-	2	2	2	-	6	-	-	6	
Forester Quarters	No.	-	6	6	6	6	24	-	-	24	
Forest Guard Quarters	No.	-	8	8	8	8	32	16	-	48	
Central Nursery Store	No.	-	2	2	-	-	4	-	-	4	
Nursery Establishment	No.	13	9	9	8	7	46	18	-	64	
Central Nursery	No.	4	-	-	-	-	4	-	-	4	
Panchayat Nursery	No.	9	9	9	8	7	42	18	-	60	
Establishment of Panchayat Forests	Ha.	25.0	90.0	193.0	296.5	395.5	1000.0	3198.0	2059.0	6257.0	
Fuelwood	Ha.	12.5	45.0	96.5	149.5	200.0	503.5	1599.0	1029.5	3132.0	
Fodder	Ha.	12.5	45.0	96.5	147.0	195.5	496.5	1599.0	1029.5	3125.0	
Establishment of Panchayat-Protected Forests	Ha.	1988	1820	1762	2043	1650	9263	4750	-	14013	
Distribution of Seedling for Community & Individual Plantings	'000 No.	20	84	147	210	275	736	1365	1365	3466	
Leased Forest Establishment	Ha.	0	12	20	20	20	72	100	150	322	
Private Forest Establishment	Ha.	0	50	50	50	50	200	300	500	1000	

(Continued)

Table 10 (Continued)

Particulars	Unit	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	I 5-Yr	II 5-Yr	III 5-Yr	G.Total	Remarks
Research Trial Plots	No.	-	40	60	80	80	260	245	245	750	
Forest Demarcation	Km.	240	480	700	880	1000	3300	6650	6450	16400	
Establishment of National Forest Plantation	Ha.	-	225	470	780	880	2355	3940	4260	10555	
Prep. of Forest Management Plan	Ha.	-	35529	35470	2115	1983	75097	6500	-	81597	
National Forest	Ha.	-	34291	33293	-	-	67584	-	-	67584	
Panchayat-Protected Forests	Ha.	-	1238	2177	2115	1983	7513	6500	-	14013	
Implementation of Management Plan	Ha.	-	-	35529	70999	73114	73114	81957	81597	81597	Cumulative
National Forest	Ha.	-	-	34291	67584	67584	67584	67584	67584	67584	Cumulative
Panchayat-Protected Forests	Ha.	-	-	1238	3415	5530	5530	14013	14013	14013	Cumulative
Working Scheme for Panchayat Forest	No.	9	9	9	8	7	42	18	-	60	
Establishment of Demonstration Sawmill	No.	-	1	1	1	1	4	-	-	4	
Charcoal Pilot Study	No.	-	-	-	-	-	-	4	-	4	
Training of Staff											
Local Training[1/]	No.	23	10	9	8	7	57	20	-	77	
Overseas Study Tour[2/]	No.	-	1	2	2	2	7	7	7	21	
Overseas Training [3/]	No.	-	1	1	1	1	4	4	4	12	

1/ 4 weeks each; 2/ 3 man-months each; 3/ 24 man-months each.

Table 11

Forest Demarcation

Catchment	TOTAL LENGTH (km)			
	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs	Total
Kulekhani	710	1225	--	1935
Daraundi	1065	2500	3000	6565
Myagdi	1065	2200	2700	5965
Mustang	460	725	750	1935
TOTAL	3300	6650	6450	16400

The demarcation in the field will be done by a field unit in Mustang and two field units in Kulekhani catchment, whereas there will be four units each in Daraundi catchment and Myagdi. A field unit will usually consist of one ranger, two foresters and two forest guards, and this team will handle a maximum of 100 km of demarcation. With every increase of 25 km of demarcation above 100 km, one forester and one forest guard will be added to the unit.

Within the project period, this program would demarcate 6,257 ha of panchayat forests, 14,013 ha of panchayat-protected forests, 10,555 ha of national plantation and 67,584 ha of national forests, with a total length of 16,400 km.

Nursery Establishment. Sixty panchayat nurseries in each panchayat and four central nurseries in each project headquarters will be established within 10 years. Each of such permanent nurseries will be 0.09 ha in size (see Appendix 4). Each central nursery will produce 0.1 million seedlings to be used for distribution for private planting and trial plots. Panchayat nurseries will each produce 50,000 seedlings to be used for stocking panchayat forests, trial plots, and for individual and community plantings. Temporary nurseries to raise seedlings for national plantations will be established as close to the planting site as possible. All these nurseries would be established at least one year prior to planting in the field. Appendix 5 provides nursery information on local species. Table 12 shows the establishment of panchayat nurseries by catchment.

Table 12

Establishment of Panchayat Nursery

Catchment	NUMBERS OF NURSERIES			
	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs	Total
Kulekhani	7	-	-	7
Daraundi	17	12	-	29
Myagdi	10	4	-	14
Mustang	8	2	-	10
TOTAL	42	18	-	60

For each central nursery a permanent nurseryman will be provided. Each unit of national plantation will also have a nurseryman. The Department of Soil and Water Conservation (DSWC) would provide a ranger in each panchayat nursery.

Each permanent nursery will have a storehouse with rooms provided for nursery staff. Tools and equipment for running the nurseries will also be provided. The full cost of the panchayat nursery will be borne by the project to encourage local participation in raising panchayat forests and planting on private land. The cost of the panchayat nursery will be borne by the panchayat itself after 15 years from the initiation of the nursery.

Establishment of Panchayat Forests. Traditionally, the forests were owned by individuals, communities, and the government, with the protection of forests being done locally (Chitaidar, Zamindar, Kipatias Binlewal and Badahakim). Nationalization of forests in 1956-57 brought forests bigger than 3 ha directly under government control. The government intention was to preserve the forests and ensure its sustained yield capacity to provide for the needs of the people. Regrettably, the people took it as a haltage to their free access and use, with a resultant resentment on the part of the people.

Before implementing the community forestry program, the local people should be made receptive of the ideas through various extension measures. Subsidy to a part of voluntary costs should also be provided, at least for a few initial years. Thus, the panchayat should be made fully motivated to carry out community forestry programs.

The selection of panchayats for community forestry development programs should depend on the villagers' receptiveness, shortage of fuelwood and fodder, availability of forests for protection, and of shrubland or grazing land for reforestation.

Panchayat forests of 6,257 ha will be raised and maintained during the project period. This will provide 125 ha of panchayat forests (present ceiling) to each panchayat, depending on availability of land for raising panchayat forests. Planting on panchayat forest will be done for fuelwood and fodder trees, using mainly local species. The list of probable species is give in Appendix 6. The following table shows the panchayat-forest plan by catchment and time period.

Table 13

Establishment of Panchayat Forests

	HA TO BE RAISED							
	1st 5 Yrs		2nd 5 Yrs		3rd 5 Yrs		Total	
Catchments	Fuel wood	Fodder	Fuel Wood	Fodder	Fuel wood	Fodder	Fuel wood	Fodder
Kulekhani	157.5	157.5	226.6	226.5	12.5	12.5	396.5	396.5
Daraundi	177.0	177.0	734.5	734.5	519.0	519.0	1430.5	1430.5
Myagdi	92.0	92.0	427.0	427.0	302.0	302.0	821.0	821.0
Mustang	77.0	70.0	211.0	211.0	196.0	196.0	484.0	477.0
TOTAL	503.5	496.5	1599.0	1599.0	1029.5	1029.5	3132.0	3125.0

Panchayat forest (PF) will be raised with full local participation. Planting, weeding and casualty replacement in the panchayat forest will be done voluntarily by local participants. All other costs will be borne by the project. A full time guard for each 25 ha or less and a fire watcher during fire season (at the rate of one watcher per every 18 ha or less) will be provided by the panchayats. After the 10th year of plantation, the number of forest watchers and fire watchers could be reduced to half. This would bring the number of watchers to one/50 ha and one/35 ha respectively for forest watching and fire watching. The cost of such watchers would be subsidized by the project at the rate of 100 percent for the first 10 years

and 50 percent after that period until the panchayat forests become economically viable. The panchayat nursery ranger will look after the panchayat forest program in the field.

Fuelwood planting will be done at 2m x 2m spacing, whereas fodder trees will be 3.5 m x 3.5 m spacing. (Fuelwood 2500 and fodder 816 plants per ha.) Fencing of panchayat forests will be limited to cases where fencing is absolutely necessary. Local materials should preferably be used for fencing. Weeding in panchayat forest plantations will be done for two years, with two weedings per year. Casualty replacement will be done in the second year of plantation. The fuelwood plantations in lower regions will be thinned in the 8th and 14th years after planting and finally felled in the 20th year. The thinning and final felling schedule in the higher regions will be at the 11th, 18th and 25th years. The work plan for each panchayat forest will be prepared by the project to carry out the panchayat forestry program.

Establishment of Panchayat-Protected Forests. Fourteen thousand thirteen (14,013) ha of panchayat-protected forests (PPF) will be established within a period of 10 years. Each panchayat will have a PPF of 250 ha (present ceiling) subject to the availability of such areas. The schedule of PPF by catchment is given below.

Table 14

Establishment of Panchayat-Protected Forests

	HA TO BE ESTABLISHED			
Catchment	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs	Total
Kulekhani	1,750	--	--	1,750
Daraundi	4,165	3,000	--	7,165
Myagdi	2,155	1,000	--	3,155
Mustang	1,193	750	--	1,943
TOTAL	9,263	4,750	--	14,013

The protection of PPF will be achieved with full participation of the local populace. The panchayat will provide watchers at the rate of one full-time forest watcher for every 50 ha or less, and one fire watcher

during fire season for every 35 ha or less. To encourage people's participation on such activities, the project will subsidize the watching cost for a period of five years from the initiation of the PPF.

PPFs will be operated according to forest management prescriptions. For each PPF, a management plan will be drawn up and implemented. Thus 14,013 ha of PPF will be put under management in the course of 10 years.

Community and Individual Planting. Planting of fuelwood and fodder trees on community waste land will be carried out to enhance the supply of fuelwood and fodder. Individual planting of trees on farmland will likewise be encouraged. Three and one-half (3.5) million trees will thus be planted by individuals and communities in the course of 15 years. Emphasis will be given to planting trees around houses and villages, along roads, along irrigation ditches and channels, on suitalbe terrace bunds and along streams and rivers. The seedlings to be planted in various catchments under this program are shown below.

Table 15

Community and Individual Planting

	NUMBER OF SEEDLINGS ('000) PLANTED			
Catchment	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs	Total
Kulekhani	240.2	308.6	232.0	780.8
Daraundi	330.5	715.0	791.5	1837.0
Myagdi	121.6	259.4	246.0	627.0
Mustang	41.7	82.0	95.5	219.2
TOTAL	734.0	1365.0	1365.0	3464.0

Each household will plant 17 trees in the first five years and 33 trees in the second and third five years each. On an average each individual will plant 16 trees during the project period of 15 years. Free seedlings will be supplied from panchayat and central nurseries for this planting.

National Plantation Establishment. National plantation of 10,555 ha will be established within the project period of 15 years on suitable areas devoid of trees such as pasture and government wasteland. This will be

done by planting primarily local species, a list of which is given in Appendix 6. The main objective of such plantation is to produce poles and timber. The area to be planted in each catchment is given in the following table.

Table 16

Establishment of National Plantations

	HA TO BE PLANTED			
Catchment	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs	Total
Kulekhani	225	205	--	430
Daraundi	825	1390	1500	3715
Myagdi	945	1565	1520	4030
Mustang	360	780	1240	2380
TOTAL	2355	3940	4260	10555

These plantations will be maintained by weeding, casualty replacement, thinning and timber stand improvement. A plantation guard at the rate of one person per every 50 ha or less and a fire watcher during fire season for every 35 ha or less will be hired.

Planting will be done at a spacing of 2 m x 2 m. The plantation will be fenced preferably using local materials. Weeding in national plantations will be done in the initital two years with two weedings per year. Casualty replacement will be done in the second year of plantation. The plantations will be thinned in the 8th, 14th, 20th, 26th, 32nd and 40th years in the lower regions and in the 11th, 18th, 25th, 33rd, 40th and 55th years in the higher regions. Final felling in the plantation will be done at 50 and 70 years respectively for lower and higher regions.

Species and Provenance Trials. Species and provenance trials will be done in the project area to determine which species and management schemes are best for the production of fodder, fuel and timber. Altogether, 750 such plots, each 0.2 ha, will be established during the project period of 15 years. The list of probable indigenous and exotic species to the tried is given in Appendices six and seven. The species in the list are only

indicative and are not necessarily fixed. The number of plots to be established by catchment is give in Table 17.

Table 17

Species and Provenance Trial Plots

Catchment	NUMBER OF TRIAL PLOTS			
	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs	Total
Kulekhani	65	50	50	165
Daraundi	65	75	75	215
Myagdi	65	60	60	185
Mustang	65	60	60	185
TOTAL	260	245	245	750

These plots will be fenced and properly maintained by weeding, casualty replacement and periodic observation and measurement. The ranger in the project office will look after this activity in collaboration with The Forest Survey and Research Office.

Preparation and Implementation of Management Plan. The national forests of 67,584 ha in the project areas will be put under scientific management. To achieve this, a management plan for each catchment will be drawn up by The Forest Survey and Research Office within the initial three years. These plans will be implemented by the project office of the forestry sector as soon as they are available. The schedule of the program is given in the following table.

Table 18

Implementation of Management Plan

Catchment	AREA IN HA		
	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs
Kulekhani	8,621	8,621	8,621
Daraundi	25,670	25,670	25,670
Myagdi	26,895	26,895	26,895
Mustang	6,398	6,398	6,398
TOTAL	67,584	67,584	67,584

Extension and Training. Seventy-seven nursery workers will be trained in the course of 15 years. Each nursery worker will receive four weeks training. Twenty-one forest officers will be sent for three months overseas study tours during the project period. Twelve people will be trained overseas in specialized subjects. Table 19 presents the training program.

Table 19

Training Program

Particulars	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total	2nd 5 Yr.	3rd 5 Yr.	Grand Total	Remarks
Local Training[1/]	23	10	9	8	7	57	20		77	For Central Nursery and National Plantati
Nurseryman	14	1				15	2		17	
Panchayat Nurseryman	9	9	9	8	7	42	18		60	
Overseas Studies Tour		1	2	2	2	7	7	7	21	
D.F.O.[2/]			1	1	1	3	3	3	9	
Attached Officer		1	1	1	1	4	4	4	12	
Overseas Training[3/]		1	1	1	1	4	4	4	12	

[1/] Four weeks each.

[2/] Three man-months each.

[3/] Twenty-four man-months each, on the following subject.

i) Forest management--six persons.
ii) Tree improvement--three persons.
iii) Research methodology--two person
iv) Sawmilling--one person.

Three and a half (3.5) million seedlings will be distributed to the local people to create their own source of fuelwood and fodder. Posters, brochures, pamphlets and radio programs will be produced to assist in motivating the people.

Construction of Buildings. Offices and housing, from project offices to forest guard quarters, will be provided within the project area. Ninety-six (96) buildings will be built in the course of 6 years. Sixty-four (64) nursery stores will also be constructed during a period of 8 years. These buildings will also be maintained. Table 20 shows the construction of a number of buildings by catchment area. (Appendix 8 gives specifications of buildings.)

Table 20

Construction of Buildings

Catchment	NUMBER OF BUILDINGS			
	1st 5 Yrs	2nd 5 Yrs	3rd 5 Yrs	Total
Kulekhani	25	--	--	25
Daraundi	35	12	--	47
Myagdi	34	12	--	46
Mustang	32	10	--	42
TOTAL	126	34	--	160

Purchase of Equipment and Vehicles. Office and field equipment will be provided by the project for the execution of the program. For Kulekhani and Daraundi catchments, two four-wheel-drive diesel jeeps will be provided together with necessary spare parts and running fuel. Horses will be provided in Myagdi and Mustang. (Appendix 9 gives the list of equipment.)

Demonstration Sawmills. Four demonstration sawmills, one in each project area, will be installed in the course of the first five years of the project. These mills will be run to demonstrate improvement in wood conversion.

Charcoal Pilot Study and Aerial Seeding. A pilot study of producing charcoal scientifically will be conducted in each project area during the second five years of the project period. This would improve wood utilization, on the one hand, and would also produce charcoal for the urban fuel demand.

The opportunity to aerially seed national forests, range land and landslides has been identified. This technique offers the possiblity to seed and reseed large areas quickly where intensive care cannot be provided, thus accelerating protective soil cover and reducing soil erosion.

Private and Leased Forests. Existing acts and rules provide for the raising of private forests on one's own land. In order to encourage people to invest in private forests, a project of raising 1000 ha of such forests has been included in the RCUP. The project will provide technical advice on establishment and management of private forests. Seedlings required for planting will be paid for by the owner of the private forest. The seedlings will be provided by the panchayat and central nurseries.

The project will help to establish lease forests to the extent of 322 ha in the course of 15 years. Seedlings will be procured by the lease from the nurseries and the project will give technical advice on raising and managing these forests. On payment, the panchayat and central nurseries will provide seedlings for planting these forests.

The project will contribute to and provide support to forest research. In this regard The Ministry of Resources will collaborate in conducting both basic and applied research. The RCUP will assist The Institute of Renewable Natural Resources to establish field research centers within RCUP areas that can be used both by The Institute (professors and students) and the Ministry of Forests.

The details of the programming of the activities are given in Appendix 10. (Appendix 10, Table 1 gives nursery establishment schedule; Table 2a, 2b, 2c and 2d give fuelwood/fodder establishment, weeding, casualty replacement and thinning schedule; Table 3 gives PPF establishment schedule; Table 4 gives community planting schedule; Table 5 shows scheduling of trial plots; Table 6 gives scheduling of forest demarcation; Tables 7a, 7b, 7c and 7d give national plantation establishment, weeding, casualty replacement and thinning schedules; Tables 8a and 8b show management plan, preparation and implementation schedule.)

Cost Estimate

The total estimated cost for the project period of 15 years is 248.4 million rupees. These include both operating and capital costs. The cost borne directly by the people in the form of voluntary labor (at full market price) is to the tune of 21.7 million rupees, being 8.7 percent of the total project cost. The foreign exchange component in the project is 24.2 million rupees, being 10 percent of the total cost.

Cost estimates for a period of the initial five years are 60.3 million rupees, including both capital and operating costs. The voluntary labor component of the total cost for five years is 1.4 million rupees (2.4 percent of the total). Foreign exchange costs are 7.9 million rupees, being 13.1 percent of the total cost for five years.

Table 21

RCUP Forestry Component Total Cost '000

Catchment Cost	Yr 1 Total	Yr 1 F.E.	Yr 2 Total	Yr 2 F.E.	Yr 3 Total	Yr 3 F.E.	Yr 4 Total	Yr 4 F.E.	Yr 5 Total	Yr 5 F.E.	1st 5 Yrs. Total	1st 5 Yrs. F.E.	2nd 5 Yrs. Total	2nd 5 Yrs. F.E.	3rd 5 Yrs. Total	3rd 5 Yrs. F.E.	Grand Total	Total F.E.	Percent F.E.
Kulekhani																			
Capital	532.0	179.8	1627.1	522.4	667.7	152.8	561.4	123.5	543.7	110.6	3931.9	1089.1	1445.2	260.9	203.7	50.4	5580.8	1400.4	26
Operating	422.6	55.8	704.1	115.0	1022.8	136.0	1166.3	140.5	1331.3	156.3	4647.1	603.6	7052.1	988.0	4167.6	627.3	15866.8	2218.9	14
Total	954.6	235.6	2331.2	637.4	1690.5	288.8	1727.7	264.0	1875.0	266.9	8579.0	1692.7	8497.3	1248.9	4371.3	677.7	21447.6	3619.3	17
Gorkha																			
Capital	819.9	237.6	2387.2	373.4	1937.5	570.1	1773.9	341.4	1511.3	264.6	8429.8	1787.1	9529.2	1679.6	5557.5	1121.2	24516.5	4587.9	19
Operating	682.0	66.3	1009.1	100.4	2019.6	154.2	2631.0	197.1	2999.7	222.2	9341.4	740.2	18742.9	1500.9	21167.5	1786.5	49251.8	4027.6	8
Total	1501.9	303.9	3396.3	473.8	3957.1	724.3	4404.9	538.5	4511.0	486.8	17771.2	2527.3	28272.1	3180.5	27725.0	2907.7	73768.3	8615.5	12
Myagdi																			
Capital	714.3	137.7	1124.5	190.7	3143.9	426.7	2762.1	635.3	2229.7	340.0	9974.5	1729.9	10309.5	1529.8	7096.9	1015.6	27380.9	4275.3	16
Operating	759.8	40.7	1114.5	68.2	1593.5	97.0	2820.2	152.0	3195.4	180.0	9483.4	537.9	18686.1	1188.3	21391.2	1453.8	49560.7	3180.0	6
Total	1474.1	177.9	2239.0	258.9	4737.4	523.7	5582.3	787.3	5425.1	520.0	19457.9	2267.8	28995.6	2718.1	28488.1	2469.4	76941.6	7455.3	10
Mustang																			
Capital	470.7	76.0	653.2	93.5	2224.0	286.1	1960.9	259.2	2060.8	456.9	7369.6	1171.7	7420.1	855.7	7717.5	842.0	22507.2	2869.4	13
Operating	588.4	35.8	796.3	43.0	1042.5	51.6	1432.6	52.9	1849.3	87.6	5709.1	270.9	11641.0	635.3	14729.8	735.0	32079.9	1641.2	5
Total	1059.1	111.8	1449.5	136.5	3266.5	337.7	3393.5	312.1	3910.1	544.5	13078.7	1442.6	19061.1	1491.0	22447.3	1577.0	54587.1	4510.6	8
Project Cost																			
Capital	2536.9	630.6	5792.0	1180.0	7973.1	1435.7	7058.3	1359.4	6345.5	1172.1	29705.8	5777.8	28704.0	4326.0	21575.6	3029.2	79985.4	13133.0	16
Operating	2452.8	198.6	3624.0	326.6	5678.4	438.8	8050.1	542.5	9375.7	646.1	29181.0	2152.6	56122.1	4312.5	61456.1	4602.6	146759.2	11067.7	8
Total	4989.7 (99.6%)	829.2	9416.0 (98.9%)	1506.6	13651.5 (98.2%)	1874.5	15108.4 (97.3%)	1901.9	15721.2 (96.0%)	1818.2	58886.8 (97.6%)	7930.4	84826.1 (91.0%)	8638.5	83031.7 (87.5%)	7631.8	226744.6 (91.3%)	24200.7	11
Voluntary Labor	22.4 (0.4%)		99.1 (1.1%)		240.6 (1.8%)		415.2 (2.7%)		653.4 (4.0%)		1430.7 (2.4%)		8353.0 (9.0%)		11890.3 (12.5%)		21674.0 (8.7%)		
TOTAL COST	5012.1	829.2	9515.1	1506.6	13892.1	1874.5	15523.6	1901.9	16374.6	1818.2	60317.5	7930.4	93179.1	8638.5	94922.0	7631.8	248418.6	24200.7	10

Details of the cost are given in Appendices 11 and 12. (Appendix 11, Tables 1a and 1b give unit cost for central and panchayat nursery; Tables 2a and 2b show unit cost for panchayat forest (fuelwood) and panchayat forest (fodder); Table 3 gives unit cost of forest demarcation; Table 4 shows unit cost for the trial plot; Table 5 shows unit cost of national plantation; Table 6 gives unit thinning cost; Table 7 gives unit cost of establishment of PPF; and Table 8 gives unit cost of management plan. Appendix 12, Tables 1a, 1b, 1c, and 1d give the capital cost; Tables 2a, 2b, 2c and 2d give operating cost; Tables 3a, 3b, 3c and 3d give foreign exchange cost; and Tables 4a, 4b, 4c and 4d give cost of voluntary labor. A summary of the cost is given in Table 21.)

Cost estimates are based on 1979 market prices. Staff and other associated costs are incremental to the existing levels. Taxes and duties have been included in the cost of imported items. However, physical contingency to the project base cost has not been included. The project allowances and traveling and daily allowances have been provided to the other territorial staff of the catchment area because these staff are also directly or indirectly involved in the program of the project. (Appendix 13, Tables 1, 2a, 2b, 2c and 2d give the staff cost.)

The daily wage for unskilled labor is Rs. 10.00 for Kulekhani and Daraundi catchments and Rs. 12.00 and Rs. 18.00 for Myagdi and Mustang.

Organization and Management

The overall forestry programs will be carried out by the Forest Department in collaboration with the village panchayats. The divisional forest officer (DFO) of each project area will have the responsibility of supervising the execution of the program in the field. The attached officer under the DFO will be responsible for implementing the programs in the field. He will be stationed at the forest project office and assisted by the subordinate staffs.

With the overall guidance and supervision of the attached officers, the ranger stationed at the forest project office will look after the central nursery, establishment and maintenance of trial plots, distribution

of seedlings and any other related work assigned by the attached officer in command. The legal and administrative aspects of forest demarcation will be dealt with by the territorial rangers. The forest demarcation in the field will be done by the demarcation units. Each demarcation unit will have a force of a ranger, two foresters and two forest guards. Additional staff will be added to the unit according to the length of demarcation. Establishment and maintenance of national plantation will be done by the plantation units. Each plantation unit will consist of a ranger, two foresters, two forest guards and one nurseryman. In accordance with the size of the plantation area, additional staff of one forester and one forest guard will be added to the unit. The demarcation and the plantation units will each be one or more, depending on the intensity of the program.

The ranger of the DSWC stationed at each panchayat will look after the panchayat nursery and DSWC will meet all the expenditures incurred. Planting, weeding and casualty replacement will be voluntarily performed by the panchayat people. All other costs will be borne by the soil and water conservation project office. The DSWC ranger will have the responsibility of raising panchayat forests. However, the allotment and demarcation of the panchayat forests will be performed by the forest office. Watchers in panchayat forests will be provided by the panchayats and the cost subsidized by the project. Management of the panchayat forests will be done by the panchayats according to the working scheme. Panchayat-protected forests will be managed according to the working plan, with full cooperation of the panchayats.

The panchayats will protect and maintain the panchayat-protected forests under the technical guidance of the local forest office. Panchayats will provide forest watchers, the cost of which will be subsidized for an initial period of five years. These forests will be operated under management plans.

The RCUP forestry projects will require an additional staff of 222. Four forestry graduates, 106 ranger/foresters and 112 other staff will be needed for the project period of 15 years. The following table shows the

summary of phasing of the staff. (Appendix 14, Tables 1a, 1b, 1c and 1d give the phasing of staff in detail.)

Table 22

Phasing of Additional Staff

Particulars	Y1	Y2	Y3	Y4	Y5	To-tal	Y6	Y7	Y8	Y9	Y10	To-tal	Y11	Y12	Y13	Y14	Y15	To-tal	Gran Tota
Attached Officer	4	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	4
Ranger	18	4	2	2	-	26	-	-	-	-	1	1	4	-	-	-	-	-	27
Forester	28	8	5	14	1	56	5	2	-	4	2	13	-	-	2	4	-	10	79
Senior Clerk	4	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	4
Driver	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
Forest Guards	28	8	5	14	1	56	5	2	-	4	2	13	4	-	2	4	-	10	79
Nurseryman	14	1	-	-	-	15	-	-	-	-	2	2	-	-	-	-	-	-	17
Peon	10	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	10
TOTAL	108	21	12	30	2	173	10	4	0	8	7	29	8	-	4	8	-	20	222

Training will be provided for 77 people in nursery work; 21 staff members will be sent on overseas study tours; and 12 forestry graduates will be sent for graduate studies in specialized subjects overseas during the project period.

Handling and control of project funding will be done at the execution level by the respective divisional forest officers. Monitoring and evaluation of the project achievements will be the responsibility of a central project coordination committee of which the chief conservator of forests would be a member. (For details see project organization chart.)

Production Markets and Prices

Production. This project will increase and then sustain the annual production of fodder, fuelwood and timber. This would be achieved by the improvement of the existing forests(national forests and panchayat forests), the establishment of new forests (national plantation and panchayat forests), and planting trees on farms and waste lands in the form of community and individual planting.

The following descriptions provide a summary of production goals. (Appendix 15 gives the basis of production estimates.)

A. Fodder and Forage. From plantation of fodder trees in panchayat forests the following quantities of fodder are obtained:

1. From lower regions (Kulekhani and Daraundi):
   a. When the plantation is 6 to 9 years old, the average yield per ha will be 17,350 kg green wieght (GW) per year;
   b. When plantation age is 10 years or more, the average yield per hear per ha will be 34,700 kg GW.
2. From upper regions (Myagdi and Mustang):
   a. When the plantation is 9 to 14 years old, the average yield per ha will be 17,350 kg GW per year;
   b. When the age is 15 years and beyond, the average yield per year will be 34,700 kg GW per ha.

The project would start producing fodder from panchayat fodder forest to the tune of 173.5 tons (GW) from the 6th year and 37.4 thousand tons (GW) in the 15th year, reaching to the maximum annual production of 108.4 thousand tons (GW) from the 29th year.

From the community and individual planting programs, the following fodder yield is expected per 1000 trees distributed.

1. From lower regions:
   a. For 6 to 9 years, the yield per 1000 trees distributed will be 7,500 kg GW per year;
   b. For 10 years and above, the yield per 1000 trees distributed will be 15,000 kg GW per year.
2. From upper regions:
   a. For 9 to 14 years, the yield per 1000 trees distributed will be 7,500 kg GW per year;
   b. For 15 years and after, the yield per 1000 trees distributed will be 15,000 kg GW per year.

The community and individual planting program would start producing fodder from the sixth year. The initial annual production will be 135.0 tons GW. Production in the 15th year would be 20.0 tons GW. From the 29th year, it could produce 52.0 thousand tons of fodder annually.

From all the plantation area, forage yield will be available for an initial three years of plantation.

1. For lower regions, the forage yield will be 500 kg GW/ha/yr.
2. For upper regions, the yield will be 250 kg GW/ha/yr.

From the plantation areas, 18.4 thousand tons of forage GW will be available in the course of the initial 17 years.

B. Fuelwood and Timber. From the plantation of fuelwood trees in the panchayat forests, the following yields are obtained:

1. For lower regions:

Age (Yrs.)	Yield (Tons/ha)
0	0
8	10
14	25
20	60

2. For upper regions:

Age (Yrs.)	Yield (Tons/ha)
0	0
11	10
18	25
25	60

From community and individual planting programs, the following production is expected:

1. For lower regions, the yield per 1000 trees distributed will be 45,000 kg at the end of 20 years;
2. For upper regions, the yield per 1000 trees distributed will be 45,000 kg at the end of 25 years.

From panchayat protected forests, the following yields will be obtained after three years of management:

1. For lower regions, the timber yield per panchayat-protected forest is 270 m^3 per year and fuelwood yield per year will be 378 tons;
2. For upper regions, the timber yield per panchayat-protected forest per year is 225 m^3 and fuelwood will be 276 tons per year.

From the national forests, the following yield will be obtained after three years:

1. For lower regions, the timber yield per year will be 1.08 m^3 and the fuelwood yield 1.51 tons;
2. For upper regions, the yields per ha per year of timber and fuelwood are 0.90 m^3 and 1.11 tons respectively.

The timber and fuelwood yield from national plantation is predicted as follows:

1. For the lower regions, the accumulated yield will be at the rate of 12 m^3 per ha per year, when harvested at 50 years;
2. For the upper regions, the accumulated yield per ha per year would be 9 m^3 when harvested at 70 years.

The fuelwood program will start producing fuelwood from the 9th year and should yield a total of 297.6 thousand tons of fuelwood GW in the course of 40 years. The panchayat-protected forests program would give an incremental yield of 19.1 thousand tons of fuelwood GW and 14.2 thousand m^3 of timber annually from the 12th year. Program on national forests would give an incremental yield of 88.7 thousand tons of fuelwood and 67.0 thousand m^3 of timber annually from the seventh year onwards. The national plantation program would produce 1979.8 thousand tons of fuelwood GW and 3512.8 thousand m^3 of timber. The extension program would produce a total of 156 thousand tons of fuelwood GW.

The production of fodder, forage, fuelwood and timber from various activities are shown in the following table. The production of fodder, fuelwood and timber has been shown graphically in Figures 1, 2 and 3 and the production from national plantation is shown in Figure 4.

Table 23

Total Production--Unit '000

Items	Unit	SPECIFICATION BY YEARS								
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45
Fodder--GW	Ton		22.1	179.1	481.1	712.9	791.9	802.0	802.0	802.0
From PF (Fodder)		x	12.6	113.4	322.9	479.2	535.2	542.2	542.2	542.2
From extension		x	9.5	65.7	158.1	233.7	256.7	259.8	259.8	259.8

(Continued)

Table 23 (Continued)

Items	Unit	SPECIFICATION BY YEARS 1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45
Forage--GW	Ton	2.4	7.7	7.3	1.0	x	x	x	x	x
From PF		0.8	3.4	3.1	0.1	x	x	x	x	x
From national plantatn.		1.6	4.3	4.2	0.9	x	x	x	x	x
FuelWood--GW	Ton	6.3	412.2	569.0	642.9	805.2	976.5	1012.1	861.1	609.8
From PF		x	0.4	7.5	27.9	61.7	94.3	75.9	29.9	x
From PPF (incremental)		6.3	55.7	94.0	95.5	95.5	95.5	95.5	95.5	95.5
From national forest (incremental)		x	355.0	443.7	443.7	443.7	443.7	443.7	443.7	443.7
From national plantatn.		x	1.1	23.8	75.8	178.6	289.6	335.5	276.6	70.6
From extension		x	x	x	x	25.7	53.4	61.5	15.4	x
Timber	m^3	4.3	345.8	392.0	406.1	406.1	438.3	510.7	681.9	681.4
From PPF (incremental)		4.3	40.8	57.0	71.1	71.1	71.1	71.1	71.1	71.1
From national forests (incremental)		x	305.0	335.0	335.0	335.0	335.0	335.0	335.0	335.0
From national plantatn.		x	x	x	x	x	32.0	104.6	275.8	275.3

(Continued)

Items	SPECIFICATION BY YEARS 46-50	51-55	56-60	61-65	66-70	71-75	76-80	81-85	86-90
Fodder--GW	802.0	x	x	x	x	x	x	x	x
From PF (Fodder)	542.2	x	x	x	x	x	x	x	x
From Extension	259.8	x	x	x	x	x	x	x	x
Forage--GW	x	x	x	x	x	x	x	x	x
From PF	x	x	x	x	x	x	x	x	x
From national plantatn.	x	x	x	x	x	x	x	x	x
Fuelwood--GW	612.7	598.1	673.8	674.7	571.1	599.0	646.7	665.7	539.2
From PF	x	x	x	x	x	x	x	x	x
From PPF (incremental)	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5
From national forest (incremental)	443.7	443.7	443.7	443.7	443.7	443.7	443.7	443.7	443.7
From national plantatn.	73.5	58.9	134.6	135.5	31.9	59.8	107.5	126.5	x
From extension	x	x	x	x	x	x	x	x	x
Timber	715.7	765.3	814.2	758.0	542.7	662.5	866.9	948.4	406.1
From PPF (incremental)	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1
From national forests (incremental)	335.0	335.0	335.0	335.0	335.0	335.0	335.0	335.0	335.0
From national plantatn.	309.6	359.2	408.1	351.9	136.6	256.4	460.8	542.3	x

Figure 2

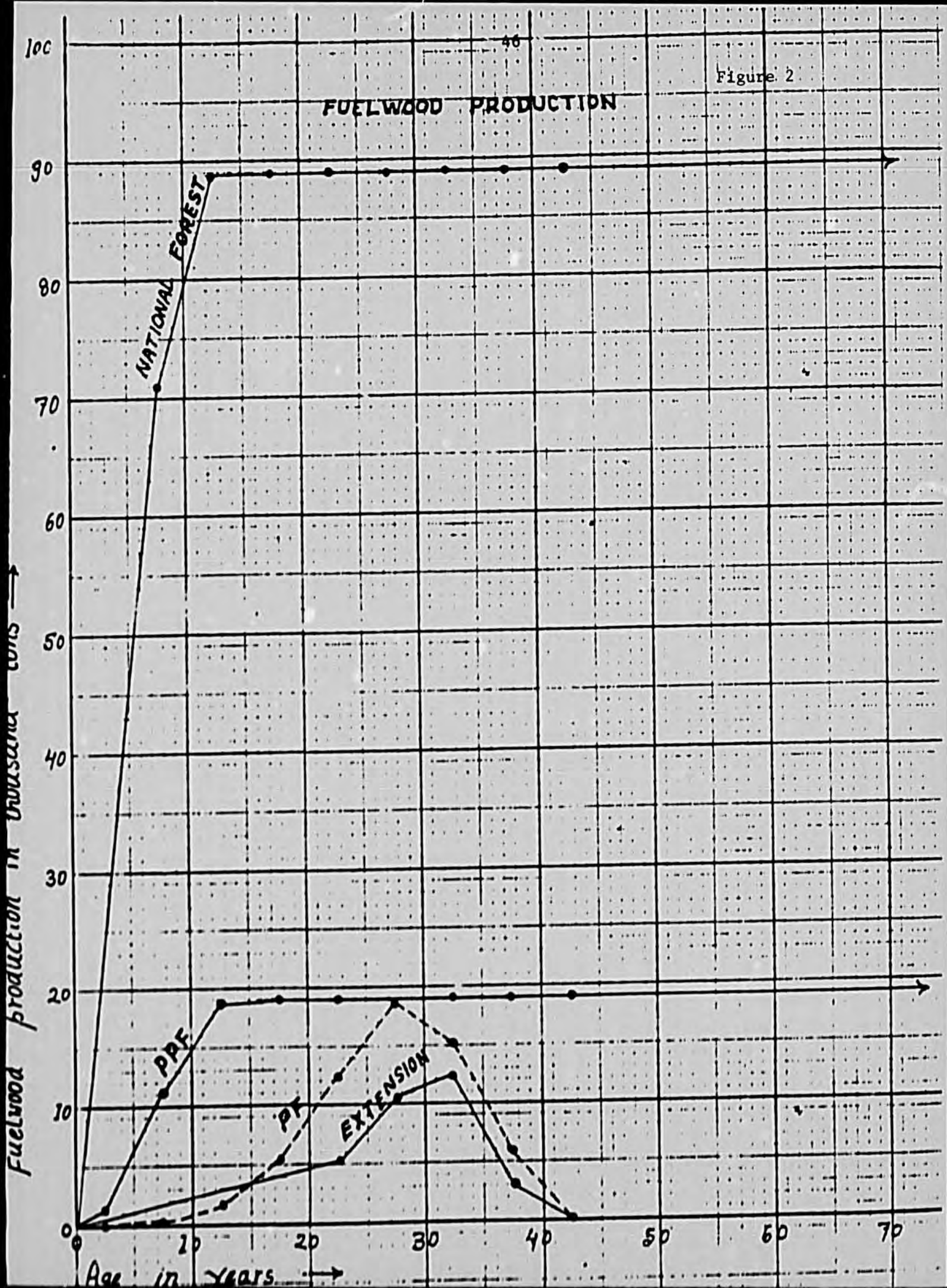
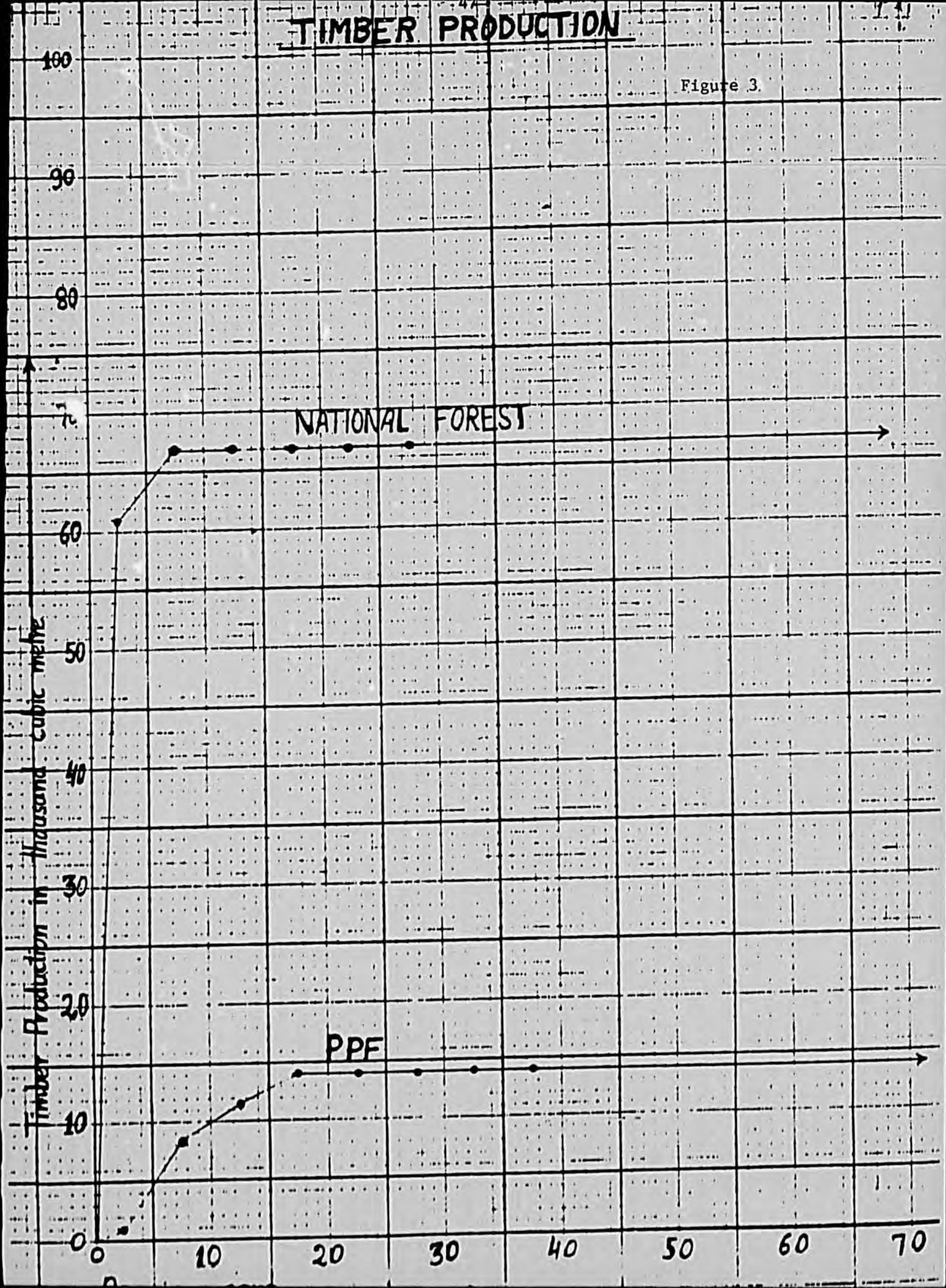

FUELWOOD PRODUCTION
NATIONAL FOREST
PPF
PF
EXTENSION
Fuelwood production in thousand tons
Age in years
0
10
20
30
40
50
60
70
80
90
100

Figure 3


TIMBER PRODUCTION
NATIONAL FOREST
PPF
Timber Production in Thousand cubic metre
100
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70

Markets and Prices. All the fodder, forage and fuelwood produced by the project will be consumed locally, as there is and continues to be a shortage of supply of fuelwood and fodder. Timber will also be locally consumed or exported where there are facilities and demand.

The value of fodder will be Rs. 3 per load of 25 kgs. GW and that of forage grass will be Rs. 1.50 per 20 kgs of GW.

The value of fuelwood will be Rs. 10 for a load of 30 kgs dry weight (DW), which is equivalent to Rs. 333 per metric ton DW.

The average government royalty on timber is Rs. 141.24 per m^3 (an average stumpage royalty rate of Rs. 4 per Cft.) As the government royalty of timber is usually below the appraised market price, the price of timber is taken to be 50 percent higher than the royalty value. The average price of timber will then be Rs. 211.86 per m^3.

Economic Benefits

Increased Production. The panchayat forest fodder plantation will start giving Rs. 20,820 from the 6th year and the revenue will go on increasing until it reaches a constant value of 13 million rupees on the 29th year. A sustained revenue of Rs. 6.2 million is obtained from the production of fodder under the extension program.

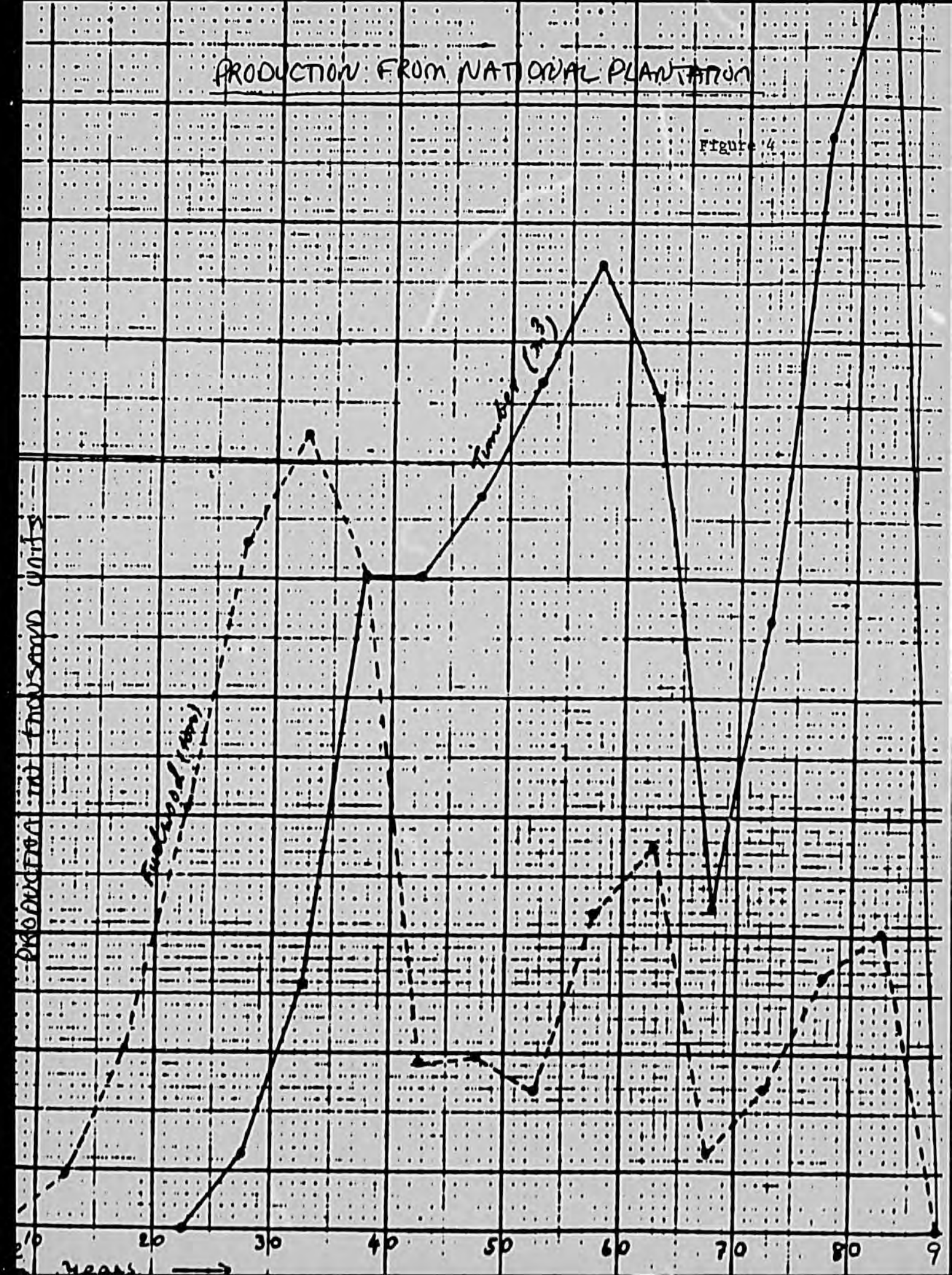
All the plantations (panchayat forests and national plantation) would give a forage yield for three years from the start, and the value of such production will amount to Rs. 1.4 million in the course of 17 years.

The forest extension activity would produce fuelwood worth 52 million rupees. Fuelwood from panchayat forest program will amount to Rs. 99.1 million. The national plantation program on pasture land will accrue to a revenue of 659.1 million rupees from fuelwood production. Fuelwood from the panchayat-protected forests will give a sustained revenue of Rs. 6.4 million from the 12th year. The development activities on national forests would provide a sustained incremental annual revenue of 29.5 million rupees from the 7th year onwards.

Money to be realized from the production of timber from the national plantation program would accrue to 794.2 million rupees. The panchayat-protected forests would sustain a constant revenue of Rs. 3 million from

PRODUCTION FROM NATIONAL PLANTATION

Figure 4



the 12th year onwards from timber. National forests would provide a sustained annual revenue of 14.2 million rupees from the 7th year of the program.

The following table (Table 24) gives the monetary value of production from various activities of the project.

Table 24

Value of Production--In Million Rupees

Items	VALUE BY YEARS								
	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45
Fodder	-	2.6	21.5	57.7	85.5	95.0	96.3	96.3	96.3
From PF (fodder plantatn.)	x	1.5	13.6	38.7	57.5	64.2	65.1	65.1	65.1
From extension	x	1.1	7.9	19.0	28.0	30.8	31.2	31.2	31.2
Forage	0.2	0.6	0.5	0.1	x	x	x	x	x
From PF	0.1	0.3	[illegible]	0.0	x	x	x	x	x
From national plantatn.	0.1	0.3	0.3	0.1	x	x	x	x	x
Fuelwood	2.1	137.2	189.5	214.1	268.2	325.2	337.1	286.8	203.1
From PF	x	0.1	2.5	9.3	20.5	31.4	25.3	10.0	x
From PPF	2.1	18.5	31.3	31.8	31.8	31.8	31.8	31.8	31.8
From national forests	x	118.2	147.8	147.8	147.8	147.8	147.8	147.8	147.8
From national plantatn.	x	0.4	7.9	25.2	59.5	96.4	111.7	92.1	23.5
From extension	x	x	x	x	8.6	17.8	20.5	5.1	x
Timber	0.9	73.2	83.1	86.1	86.1	92.9	108.3	144.5	144.4
From PPF	0.9	8.6	12.1	15.1	15.1	15.1	15.1	15.1	15.1
From national forests	x	64.6	71.0	71.0	71.0	71.0	71.0	71.0	71.0
From national plantatn.	x	x	x	x	6.8	22.2	58.4	58.3	65.5

(Continued)

Items	VALUE BY YEARS								
	46-50	51-55	56-60	61-65	66-70	71-75	76-80	81-85	86-90
Fodder	x	96.3	x	x	x	x	x	x	x
From PF (fodder plantatn.)	x	65.1	x	x	x	x	x	x	x
From extension	x	31.2	x	x	x	x	x	x	x
Forage	x	x	x	x	x	x	x	x	x
From PF	x	x	x	x	x	x	x	x	x
From national plantatn.	x	x	x	x	x	x	x	x	x

(Continued)

Table 24 (Continued)

Items	VALUE BY YEARS								
	46-50	51-55	56-60	61-65	66-70	71-75	76-80	81-85	86-90
Fuelwood	204.1	199.2	224.4	224.7	190.2	199.5	215.4	221.7	179.6
From PF	x	x	x	x	x	x	x	x	x
From PPF	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8
From national forests	147.8	147.8	147.8	147.8	147.8	147.8	147.8	147.8	147.8
From national plantatn.	24.5	19.6	44.8	45.1	10.6	19.9	35.8	42.1	x
From extension	x	x	x	x	x	x	x	x	x
Timber	151.7	162.2	172.6	160.7	115.1	140.4	183.7	201.0	86.1
From PPF	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1
From national forests	71.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0
From national plantation	65.6	76.1	86.5	74.6	28.9	54.3	97.6	114.9	x

Unquantifiable Benefits. The unquantifiable benefits accruing from the forestry component of RCUP project are:

1. The project would add to the development of a spirit of self-reliance among villagers, which is a basis of any rural development process;
2. It would strengthen the forest department organization in the field through training and increasing facility;
3. Amelioration of the environment and enhancement of aesthetic value will be brought in;
4. Regulation of water flow in the catchment, reduction of erosion dangers and flood runoff, and decrease in the silt load on valleys would occur;
5. Benefits from the protection of other infrastructures would be obtained;
6. Agricultural land would be stable and more productive due to a favorable effect on micro-climatic conditions.

Employment. During the project period of 15 years, underemployment of the unskilled village people would be reduced. Additional labor from outside the project area would be required. An employment of 1.8 million

mandays would be generated during the first five years and this would rise to 2.0 million mandays during the second five year period. One and a half (1.5) million mandays of paid work would be available during the third 5 years. The total mandays of unskilled labor requirement will be nearly 5.3 million mandays, meaning 1.8 million manmonths of work. In other words, about 15,000 unskilled people will receive full-time jobs over the project period. Besides unskilled employment, there would be ample opportunity for the employment of semiskilled and skilled workers.

The following table (Table 25) shows the employment of unskilled labor.

Table 25

Employment of Unskilled Labor--'000 Mandays

	PERIOD			
Catchment	1-5 Yrs	6-10 Yrs	10-15 Yrs	TOTAL
Kulekhani	286.0	153.4	33.4	472.8
Daraundi	643.7	672.2	388.6	1704.5
Myagdi	624.4	846.2	783.1	2253.7
Mustang	262.6	285.4	281.8	829.8
TOTAL	1816.7	1957.2	1486.9	5260.8

Economic Rate of Return. For economic efficiency measures and sensitivity analysis, refer to the US AID Consultant's report on the subject.

KULEKHANI CATCHMENT
LAND USE BY PANCHAYAT
1979
Area in Sq. Km.

Panchayat	Cultivated	Pasture	Forest	Rocks	Snow	Others	T O T A L
Kulekhani	10.41	3.50	20.09	-	-	0.66	34.66
Chitlang	13.12	7.10	11.26	-	-	0.78	32.26
Palung	9.40	0.75	4.35	-	-	0.60	15.10
Daman	12.45	2.32	22.75	-	-	0.78	38.30
Thahachok	12.23	2.87	9.18	-	-	0.72	25.00
Sisneri	11.11	2.27	16.52	-	-	0.66	30.56
Phakhel	13.18	2.40	19.56	-	-	0.84	35.98
T O T A L	89.90	21.21	103.71	-	-	5.04	211.86
P E R C E N T A G E	38.6	10.0	49.0	-	-	2.4	100.0

KULEKHANI CATCHMENT
FOREST BY ALTITUDE
Area in Hectare
Elevation in '000 Meters

Panchayat	Below 1.2	1.2-1.8	1.8-2.4	2.4-3.0	T O T A L
Kulekhani	-	13.14	6.95	-	20.09
Chitlang	-	1.68	9.58	-	11.26
Palung	-	.20	4.15	-	4.35
Daman	-	1.60	18.39	2.76	22.75
Thahachok	-	2.00	7.18	-	9.18
Sisneri	1.44	11.84	3.24	-	16.52
Phakhel	-	3.20	15.76	.60	19.56
T O T A L	1.44	33.66	65.25	3.36	103.71
P E R C E N T A G E	1.4	32.5	62.9	3.2	100.0

KULEKHANI CATCHMENT

Present & Projected Land Use by Panchayat

(Area in Ha.)

Attachment 1 Table 3-a

Panchayat	Land Use	Cultivated Land (private)	Improved pasture (private)	Pasture	Panchayat forest	Panchayat protected forest	National forest	National plantation	Snow covered	Exposed rocks	Others	T O T A L
Palung	Present	940	0	75	0	0	435	0	0	0	60	1510
	Projected	861	79	32	43	250	183	0	0	0	62	1510
Daman	Present	1245	0	232	0	0	2275	0	0	0	78	3830
	Projected	1140	105	107	125	250	2022	0	0	0	81	3830
Thahachok	Present	1223	0	287	0	0	918	0	0	0	72	2500
	Projected	1120	103	122	125	250	665	40	0	0	75	2500
Chitland	Present	1312	0	710	0	0	1126	0	0	0	78	3226
	Projected	1201	111	285	125	250	873	300	0	0	81	3226
Kulekhani	Present	1041	0	350	0	0	2009	0	0	0	66	3466
	Projected	953	88	135	125	250	1756	90	0	0	69	3466
Sisneri	Present	1111	0	227	0	0	1652	0	0	0	66	3056
	Projected	1017	94	102	125	250	1399	0	0	0	69	3056
Phakhel	Present	1318	0	240	0	0	1956	0	0	0	84	3598
	Projected	1207	111	115	125	250	1703	0	0	0	87	3598
T O T A L	Present	8190	0	2121	0	0	10371	0	0	0	504	21186
	Projected	7499	691	898	793	1750	8601	430	0	0	524	21186

Attachment 1 Table 1-b

DARAUNDI CATCHMENT
LAND USE OF PANCHAYAT
1979
Area in Sq. Km.

Panchayat	Cultivated	Pasture	Forest	Rocks	Snow	Others	TOTAL
Chhoprak	16.88	3.36	6.80	-	-	1.07	28.06
Mareswar	9.28	1.76	2.38	-	-	0.57	13.99
Maniswarra	7.92	0.55	8.39	-	-	0.43	17.29
Barpak	9.96	30.18	51.52	-	4.34	0.64	96.64
Muchok	7.22	6.12	1.77	-	-	0.44	15.55
Jaubari	6.48	7.80	5.03	-	-	0.37	19.68
Deorali	10.57	0.48	19.49	-	-	0.67	31.21
Taranagar	10.75	0.00	9.67	-	-	0.68	21.10
Gorakhkali	9.37	0.66	9.51	-	-	0.53	20.07
Taklung	11.26	1.78	9.21	-	-	0.63	22.88
Khanchok	11.33	4.53	2.86	-	-	0.70	19.42
Pandrung	12.37	6.60	2.73	-	-	0.76	22.46
Tako	12.73	4.78	5.46	-	-	0.76	23.73
Taple	7.92	2.25	4.87	-	-	0.46	15.50
Harmi	12.44	1.72	3.54	-	-	0.76	18.46
Appipal	10.02	0.75	6.09	-	-	0.58	17.44
Palungtar	14.84	0.82	9.87	-	-	0.81	26.34
Swara	6.49	7.02	19.27	-	-	0.29	33.07
Simjung	18.69	34.00	32.68	-	2.04	0.99	88.40
Srinath Kot	8.58	3.13	8.30	-	-	0.47	20.48
Saurpani	16.35	1.74	15.85	-	-	0.89	34.83
Bumgkot	9.22	3.40	16.04	-	-	0.43	29.09
Bhogteni	7.98	1.55	14.67	-	-	0.36	24.56
Ghairung	8.21	2.16	9.15	-	-	0.43	19.95
Manakamana	15.44	4.15	12.08	-	-	0.86	32.53
Dhuwakot	7.41	0.88	8.69	-	-	0.36	17.34
Mirkot	9.73	1.26	13.12	-	-	0.45	24.56
Gaikhur	7.98	1.04	9.72	-	-	0.37	19.11
Khoplang	10.43	0.51	9.59	-	-	0.53	21.06
TOTAL	307.80	134.98	328.35	-	6.38	17.29	794.80
PERCENTAGE	38.7	17.0	41.3	-	0.8	2.2	100.0

Attachment 1 Table 2-b

DARAUNDI CATCHMENT
FOREST BY ALTITUTE

Area in Hectare
Elevation in '000 Meters

Panchayat	Below 1.2	1.2-1.8	1.8-2.4	2.4-3.0	3.0-4.0	TOTAL
Chhoprak	513	167	-	-	-	680
Mareswar	238	-	-	-	-	238
Raniswara	793	46	-	-	-	839
Barpak	168	1008	1574	1745	657	5152
Muchok	140	37	-	-	-	177
Jaubari	164	339	-	-	-	503
Deorali	1938	11	-	-	-	1949
Taramagar	967	-	-	-	-	967
Gorakhkali	921	30	-	-	-	951
Taklung	725	196	-	-	-	921
Khanchok	286	-	-	-	-	286
Pandrung	273	-	-	-	-	273
Tako	546	-	-	-	-	546
Tapla	487	-	-	-	-	487
Marni	332	22	-	-	-	354
Appipal	609	-	-	-	-	609
Palungtar	987	-	-	-	-	987
Swara	356	665	577	329	-	1927
Simjung	343	585	1112	916	312	3268
Srinath Kot	538	292	-	-	-	830
Saurpani	760	451	356	18	-	1585
Bungkot	1604	-	-	-	-	1604
Bhogteni	1275	192	-	-	-	1467
Ghairung	786	129	-	-	-	915
Manakamana	1107	101	-	-	-	1208
Dhuwakot	869	-	-	-	-	869
Mirkot	1312	-	-	-	-	1312
Gaithur	972	-	-	-	-	972
Khoplang	959	-	-	-	-	959
TOTAL	20968	4271	3619	3008	969	32835
PERCENTAGE	63.8	13.0	11.0	9.2	3.0	100.0

Daraundi Catchment

Present and Projected Land Use by Panchayats

Attachment 1 Table 3-b

(Area in ha)

Panchayat	Land Use	Cultivated Land (Private)	Improved Pasture (Private)	Pasture	Panchayat Forest	Panchayat Protected Forest	National Forest	National Plantation	Snow Covered	Exposed Rock	Others	Total
1. Swara	Present	649	0	702	0	0	1,927	0	0	0	29	3,307
	Projected	611	37	267	125	250	1,677	310	0	0	30	3,307
2. Simjung	Present	1,869	0	3,400	0	0	3,268	0	204	0	99	8,840
	Projected	1,761	106	2,275	125	250	3,018	1,000	204	0	101	8,840
3. Barpak	Present	996	0	3,018	0	0	5,152	0	434	0	64	9,664
	Projected	938	56	2,513	125	250	4,902	380	434	0	66	9,664
4. Mankamana	Present	1,544	0	415	0	0	1,208	0	0	0	86	3,253
	Projected	1,455	87	110	125	250	958	180	0	0	88	3,253
5. Bhogteni	Present	798	0	155	0	0	1,467	0	0	0	36	2,456
	Projected	752	45	41	114	250	1,217	0	0	0	37	2,456
6. Deorali	Present	1,057	0	48	0	0	1,949	0	0	0	67	3,121
	Projected	996	59	12	36	250	1,699	0	0	0	69	3,121
7. Rani Swara	Present	792	0	55	0	0	839	0	0	0	43	1,729
	Projected	746	45	19	36	250	589	0	0	0	44	1,729
8. Bung - Kot	Present	922	0	340	0	0	1,604	0	0	0	43	2,909
	Projected	869	52	95	125	250	1,354	120	0	0	44	2,909
9. Gorkhakali	Present	937	0	66	0	0	951	0	0	0	53	2,007
	Projected	882	53	18	48	250	701	0	0	0	54	2,007
10. Taple	Present	792	0	225	0	0	487	0	0	0	46	1,550
	Projected	748	45	60	125	250	237	40	0	0	47	1,550
11. Nareswar	Present	928	0	176	0	0	238	0	0	0	57	1,339
	Projected	874	53	51	125	238	0	0	0	0	58	1,339
Sub-Total	Present	11,284	0	8,600	0	0	19,090	0	638	0	623	40,235
	Projected	10,631	638	5,461	1,109	2,738	16,352	2,030	638	0	638	40,235

Baraundi Catchment

Present and Projected Land Use by Panchayat

Attachment 1 Table 3-b (cont.)

(Area in ha)

Panchayat	Land Use	Cultivated Land (Private)	Improved Pasture (Private)	Pasture	Panchayat Forest	Panchayat Protected Forest	National Forest	National Plantation	Snow Covered	Exposed Rock	Others	Total
12. Chhoprak	Present	1,683	0	336	0	0	680	0			107	2,806
	Projected	1,586	94	91	125	250	430	120			110	2,806
13. Khanchok	Present	1,133	0	453	0	0	286	0			70	1,942
	Projected	1,067	64	128	125	250	36	200			72	1,942
14. Pandrung	Present	1,237	0	660	0	0	273	0			76	2,246
	Projected	1,165	70	195	125	250	23	340			78	2,246
15. Srinath Kot	Present	858	0	313	0	0	830	0			47	2,048
	Projected	808	49	103	125	250	580	85			48	2,048
16. Tako	Present	1,273	0	478	0	0	546	0			76	2,373
	Projected	1,199	72	153	125	250	296	200			78	2,373
17. Jaubari	Present	648	0	780	0	0	503	0			37	1,968
	Projected	611	36	235	125	250	253	420			38	1,968
18. Muchok	Present	722	0	612	0	0	177	0			44	1,555
	Projected	680	41	187	125	177	0	300			45	1,555
19. Taklung	Present	1,126	0	178	0	0	921	0			63	2,288
	Projected	1,061	64	53	125	250	671	0			64	2,288
20. Marni	Present	1,244	0	172	0	0	354	0			76	1,846
	Projected	1,172	70	46	124	253	104	0			78	1,846
21. Chairung	Present	821	0	216	0	0	915	0			43	1,995
	Projected	774	46	71	125	250	665	20			44	1,995
22. Appipal	Present	1,002	0	75	0	0	609	0			58	1,744
	Projected	944	57	19	56	250	359	0			59	1,744
Sub-Total	Present	11,747	0	4,273	0	0	6,094	0			697	22,811
	Projected	11,067	663	1,283	1,305	2,677	3,417	1,685			714	22,811

Baraundi Catchment

Attachment 1 Table 3-b (cont.)

Present and projected Land use by Panchayat

(Area in ha)

	Land Use	Cultivated Land (Private)	Improved Pasture (Private)	Pasture	Panchayat Forest	Panchayat Protected Forest	National Forest	National Plantation	Snow Covered	Exposed Rock	Others	Total
23. Saurpani	Present	1,635	0	174	0	0	1,585	0			89	3,483
	Projected	1,540	93	64	110	250	1,335	0			91	3,483
24. Dhuwakot	Present	741	0	88	0	0	869	0			36	1,734
	Projected	698	42	22	66	250	619	0			37	1,734
25. Mirkot	Present	973	0	126	0	0	1,312	0			45	2,456
	Projected	917	55	32	94	250	1,062	0			46	2,456
26. Taranagar	Present	1,075	0	0	0	0	967	0			68	2,110
	Projected	1,013	60	0	0	250	717	0			70	2,110
27. Palung Tar	Present	1,484	0	82	0	0	987	0			81	2,634
	Projected	1,398	84	21	61	250	737	0			83	2,634
28. Gaikhur	Present	798	0	104	0	0	972	0			37	1,911
	Projected	752	45	26	78	250	722	0			38	1,911
29. Khoplang	Present	1,043	0	51	0	0	959	0			53	2,106
	Projected	983	59	13	38	250	709	0			54	2,106
Sub-Total	Present	7,749	0	625	0	0	7,651	0			409	16,434
	Projected	7,301	438	178	447	1,750	5,901	0			419	16,434
GRAND TOTAL	Present	30,780	0	13,498	0	0	32,835	0	638	-	1,729	79,480
	Projected	28,999	1,739	6,922	2,861	7,165	25,670	3,715	638	-	1,771	79,480

Attachment 1 Table 1-c

MYAGDI UPPER KALI GANDAKI CATCHMENT
Land Use by Panchayat
'1979'
Area in sq. km.

Panchayat	Cultivated	Pasture	Forest	Rocks	Snow	Others	Total
Ramche	13.23	13.50	12.60	-	-	0.81	40.14
Histhan Mandalli	9.10	10.73	21.60	-	-	0.56	41.99
Sikha Adarsa	12.76	19.90	13.41	-	-	0.80	46.87
Baraha	7.81	45.27	26.51	1.33	9.05	0.47	90.44
Pipale	7.04	1.24	2.91	-	-	0.44	11.63
Bhagawati	9.50	1.62	0.40	-	-	0.61	12.13
Beg Khola	8.45	5.84	8.21	-	-	0.51	23.01
Beba	8.99	5.62	21.28	-	-	0.50	36.39
Barmija	16.87	31.79	63.28	0.19	5.41	1.00	118.54
Pakhapani	14.02	4.64	29.60	-	-	0.83	49.09
Jhee	6.12	1.49	2.22	-	-	0.38	10.21
Chatan	10.92	2.27	1.43	-	-	0.69	15.31
Kuime Mangale	9.73	36.77	74.85	-	31.83	0.56	153.74
Dana	8.90	105.10	22.20	38.10	119.65	0.52	294.47
Total	143.44	285.78	300.50	39.62	165.94	8.68	943.96
Percentage	15.2	30.3	31.8	4.2	17.6	0.9	100.0

MYAGDI CATCHMENT

Forest by Altitude
Area in Hectare - Elevation in '000 meters

Panchayat	Below 1.2	1.2 - 1.8	1.8 - 2.4	2.4 - 3.0	3.0 - 4.0	Total
Ramche	-	87	437	656	80	1260
Bisthan Mandalli	20	34	357	1534	215	2160
Sikha Adereo	-	-	160	882	299	1341
Baraha	-	29	546	1425	651	2651
Pipale	18	100	173	-	-	291
Bhagawati	-	-	4	36	-	40
Beg Khola	-	103	374	344	-	841
Doba	66	285	672	666	439	2128
Baraundi	23	265	724	1767	3549	6328
Pakhapani	-	113	964	1730	153	2960
Jhao	23	29	139	31	-	222
Chatan	36	16	91	-	-	143
Kaine Mangale	-	26	995	3292	3172	7485
Dana	-	117	524	936	643	2220
Total	186	1204	6160	13299	9201	30050
Percentage	0.6	4.0	20.5	44.3	30.6	100.0

Attachment 1 Table 3-c

MYAGDI CATCHMENT AREAS
Present and Projected Land Use by Panchayat
Area in ha.

Name of Panchayat	Land Use	Cultivated (Private)	Improved Pasture (private)	Pasture	Panchayat Forest	P-Protected Forest	National Forest	National Plantation	Snow Covered	Exposed Rocks	Others	Total
1. Ramche	Present	1323	0	1353	0	0	1260	0			81	4014
	Projected	1246	75	610	125	250	1010	615			83	4014
2. Mistham Mandalli	Present	910	0	1073	0	0	2160	0			56	4199
	Projected	857	52	523	125	250	1910	425			57	4199
3. Sikha Adarsa	Present	1276	0	1990	0	0	1341	0			80	4687
	Projected	1202	72	1330	125	250	1091	535			82	4687
4. Baraha	Present	781	0	4527	0	0	2651	0	905	133	47	9044
	Projected	736	44	3897	125	250	2401	505	905	133	48	9044
5. Pipale	Present	704	0	124	0	0	291	0			44	1163
	Projected	663	40	39	85	250	41	0			45	1163
6. Bhagawati	Present	950	0	162	0	0	40	0			61	1213
	Projected	895	54	63	99	40	0	0			62	1213
7. Beg Khola	Present	845	0	584	0	0	821	0			51	2301
	Projected	796	48	244	125	250	571	215			52	2301

MYAGDI CATCHMENT AREAS
Present and Projected Land Use by Panchayat
Area in ha.

Name of Panchayat	Land Use	Cultivated (Private)	Improved Pasture (private)	Pasture	Panchayat Forest	P-Protected Forest	National Forest	National Plantation	Snow Covered	Exposed Rocks	Others	Total
8. Doba	Present	899	0	562	0	0	2128	0			550	3639
	Projected	847	51	242	125	250	1878	195			51	3639
9. Darmija	Present	1687	0	3179	0	0	6328	0	541	19	100	11854
	Projected	1589	96	2934	125	250	6078	120	541	19	102	11854
10. Pakhepani	Present	1402	0	464	0	0	2960	0			83	4909
	Projected	1321	79	249	125	250	2710	90			85	4909
11. Jhee	Present	612	0	149	0	0	222	0			38	1021
	Projected	577	34	66	83	222	0	0			39	1021
12. Ghetan	Present	1092	0	227	0	0	143	0			69	1531
	Projected	1029	61	102	125	143	0	0			71	1531
13. Kuine Mangale	Present	973	0	3677	0	0	7485	0	3183	0	56	15374
	Projected	917	55	3257	125	250	7235	295	3183	0	57	15374
14. Dane	Present	890	0	10510	0	0	2220	0	11965	3810	52	29447
	Projected	839	50	9350	125	250	1970	1035	11965	3810	53	29447
Total	Present	14344	0	28578	0	0	30050	0	16594	3962	868	94396
	Projected	13514	811	22906	1642	3135	26895	4030	16594	3962	887	94396

N.B. Area under national plantation has been estimated using the following deductions in the pastureland classified:

Elevation in '000 meters	Below 1.2	1.2-1.8	1.8-2.4	2.4-.3.0	3.0-4.0
Percentage	25%	35%	45%	55%	100%

Attachment 1 Table 1-d

MUSTANG CATCHMENT
LAND USE BY PANCHAYAT
1979
Area in Sq. Km.

Panchayat	Cultivated	Pasture	Forest	Rocks	Snow	Others	TOTAL
Marpha	5.15	106.47	23.00	9.64	195.33	0.19	339.78
Lete	5.82	25.44	16.23	-	1.05	0.32	48.86
Tukuche	3.33	41.65	9.34	5.17	102.04	0.16	161.69
Kunje	7.46	43.82	15.43	2.28	6.68	0.42	76.09
Jomsom	2.34	52.51	5.61	14.39	30.08	0.12	105.05
Muktinath	3.55	18.59	-	15.73	37.25	0.23	75.35
Kowang	3.83	47.76	8.40	5.65	23.55	0.19	89.38
Kagbeni	2.66	73.57	1.95	23.40	55.85	0.16	157.59
Jharkot	1.81	18.94	0.23	5.90	7.09	0.11	34.08
Chhusang	2.79	119.92	3.44	67.22	283.83	0.16	477.36
T O T A L	38.74	548.67	83.63	149.38	742.75	2.06	1565.23
P E R C E N T A G E	2.5	35.1	5.3	9.5	47.5	0.1	100.0

N.B. Land use information on six Panchayats is not available.

Attachment 1 Table 2-d

MUSTANG CATCHMENT
FOREST BY ALTITUDE

Area in Hectare - Elevation in '000 Meters

Panchayat	Below 1.2	1.2 - 1.8	1.8 - 2.4	2.4 - 3.0	3.0 - 4.0	TOTAL
Marpha	-	-	-	248	2052	2300
Lete	-	26	204	730	663	1623
Tukuche	-	-	-	370	564	934
Kunje	-	6	120	852	565	1543
Jomsom	-	-	-	3	558	561
Muktinath	-	-	-	-	-	-
Kowang	-	-	-	537	303	840
Kagbeni	-	-	-	-	195	195
Jherkot	-	-	-	23	-	23
Chhusang	-	-	-	-	344	344
TOTAL	-	32	324	2763	5244	8363
PERCENTAGE	-	0.4	3.9	33.0	62.7	100.0

Attachment 1 Table 3-d

MUSTANG CATCHMENT AREAS
Present & Projected Land Use by Panchayat
Area In Ha.

Name Of Panchayat	Land Use	Cultivated land (Private)	Improved pasture (Private)	Pasture	Panchayat forest	Panchayat protected forest	National forest	National plantation	Snow covered	Exposed rocks	Others	T O T A L
Lete	Present	582	0	2544	0	0	1623	0	105	-	32	4886
	Projected	576	0	2219	125	250	1370	200	105	-	35	4886
Kunje	Present	746	0	4382	0	0	1543	0	668	228	42	7609
	Projected	739	7	3797	125	250	1289	460	668	228	46	7609
Kowang	Present	383	0	4776	0	0	840	0	2355	565	19	8938
	Projected	379	4	4431	125	250	588	220	2355	565	21	8938
Takuche	Present	333	0	4165	0	0	934	0	10204	517	16	16169
	Projected	330	3	3940	125	250	682	100	10204	517	18	16169
Marpha	Present	515	0	10647	0	0	2300	0	19533	964	19	33978
	Projected	510	5	9902	125	250	2048	620	19533	964	21	33978
Jomsom	Present	234	0	5251	0	0	561	0	3008	1439	12	10505
	Projected	232	2	4826	125	250	310	300	3008	1439	13	10505
Jharkot	Present	181	0	1894	0	0	23	0	709	590	11	3408
	Projected	179	2	1845	49	22	0	0	709	590	12	3408
Muktinath	Present	355	0	1859	0	0	-	0	3725	1573	23	7535
	Projected	351	4	1852	7	0	0	0	3725	1573	23	7535
Kagbeni	Present	266	0	7357	0	0	195	0	5585	2340	16	15759
	Projected	263	3	6992	125	193	0	240	5585	2340	18	15759
Chhusang	Present	279	0	11992	0	0	344	0	28383	6722	16	47736
	Projected	276	3	11627	125	250	92	240	28383	6722	18	47736
T O T A L	Present	3874	0	54867	0	0	8363	0	74275	14938	206	156523
	Projected	3835	39	51431	1056	1965	6379	2380	74275	14938	225	156523

Attachment 2 Table 1-a

KULEKHANI CATCHMENT

WOOD VOLUME IN '000 CU. M.
Elevation in '000 Meters

Elevation Volume	BELOW 1.2		1.2 - 1.8		1.8 - 2.4		2.4 - 3.0		TOTAL	
Panchayat	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood
Kulekhani	-	-	32.50	38.37	37.07	44.27	-	-	69.57	82.64
Chitang	-	-	4.16	4.88	51.09	61.02	-	-	55.25	65.90
Palung	-	-	0.50	0.58	22.13	26.44	-	-	22.63	27.02
Daman	-	-	3.96	4.65	98.08	117.14	14.71	17.58	116.75	139.37
Thahachok	-	-	4.95	5.81	38.29	45.73	-	-	43.24	51.54
Sisneri	3.09	3.82	29.29	34.39	17.15	20.63	-	-	49.53	58.84
Phakhel	-	-	7.92	9.30	84.04	100.38	3.16	3.83	95.12	113.51
TOTAL	3.09	3.82	83.28	97.98	347.85	415.61	17.87	21.41	452.09	538.82
TIMBER %	0.7	-	18.4	-	76.9	-	4.0	-	100.0	-
ALL WOOD %	-	0.7	-	18.2	-	77.1	-	4.0	-	100.0

DARAUNDI CATCHMENT
WOOD VOLUME IN '000 CU. M.
Elevation in '000 Meters

Attachment 2 Table 1-b

Elevation	Below 1.2		1.2 - 1.8		1.8 - 2.4		Above 2.4		TOTAL	
Panchayat/Volume	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood
Chhoprak	10.28	15.89	4.27	4.98	-	-	-	-	14.55	20.87
Nareswar	4.77	7.37	-	-	-	-	-	-	4.77	7.37
Raniswara	15.90	24.56	1.18	1.37	-	-	-	-	17.08	25.93
Barpak	3.37	5.20	25.76	30.04	75.23	90.05	172.90	198.15	277.26	323.44
Muchok	2.81	4.34	0.95	1.10	-	-	-	-	3.76	5.44
Jaubari	3.29	5.08	8.66	10.10	-	-	-	-	11.95	15.18
Deorali	38.86	60.02	0.28	0.33	-	-	-	-	39.14	60.35
Taranagar	19.39	29.95	-	-	-	-	-	-	19.39	29.95
Gorakhkali	18.47	28.53	0.77	0.89	-	-	-	-	19.24	29.42
Taklung	14.54	22.45	5.01	5.84	-	-	-	-	19.55	28.29
Khanchok	5.73	8.86	-	-	-	-	-	-	5.73	8.86
Pandrung	5.47	8.46	-	-	-	-	-	-	5.47	8.46
Tako	10.95	16.91	-	-	-	-	-	-	10.95	16.91
Taple	9.76	15.08	-	-	-	-	-	-	9.76	15.08
Harmi	6.6	10.28	0.56	0.66	-	-	-	-	7.22	10.94
Appipal	12.21	18.86	-	-	-	-	-	-	12.21	18.86
Palungtar	19.79	30.57	-	-	-	-	-	-	19.79	30.57
Swara	7.14	11.03	16.99	19.38	25.41	30.46	29.69	27.65	73.23	88.52
Simjung	6.88	10.62	14.95	17.44	59.29	70.84	88.39	101.30	169.51	200.20
Srinath Kot	10.78	16.66	7.47	8.71	-	-	-	-	18.25	25.37
Saurpani	15.24	23.54	11.52	13.44	18.98	22.67	1.30	1.49	47.04	61.14
Bunghot	26.27	40.39	-	-	-	-	-	-	26.27	40.39
Bhogteni	25.56	39.73	4.91	5.73	-	-	-	-	30.47	45.46
Gairung	15.76	24.35	3.30	3.84	-	-	-	-	19.06	28.19
Manakamana	22.20	34.89	2.58	3.01	-	-	-	-	24.78	37.90
Dhuwakot	17.42	26.92	-	-	-	-	-	-	17.42	26.92
Mirkot	26.31	40.63	-	-	-	-	-	-	26.31	40.63
Gaikhur	19.49	30.10	-	-	-	-	-	-	19.49	30.10
Khoplang	19.23	29.70	-	-	-	-	-	-	19.23	29.70
TOTAL	414.53	640.97	109.16	126.86	178.91	214.02	286.28	328.59	988.88	1310.44
TIMBER %	41.9	-	11.1	-	18.1	-	28.9	-	100.0	-
ALL WOOD %	-	48.9	-	9.7	-	16.3	-	25.1	-	100.0

Attachment 2 Table 1-c

MYAGDI CATCHMENT

Volume in '000 cu.m./elevation

Elevation in '000 meters

Panchayat	Below 1.2		1.2 - 1.8		1.8 - 2.4		2.4 - 3.0		TOTAL	
	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood
Ranche	-	-	2.1	2.5	23.3	27.9	48.9	56.6	74.3	86.9
Histan Mandalli	0.4	0.5	0.8	1.0	19.0	22.7	116.2	134.3	136.4	158.5
Sikho Adaraha	-	-	-	-	8.5	10.2	78.5	90.7	87.0	100.9
Baraha	-	-	0.7	0.9	29.1	34.0	138.0	159.4	167.8	195.1
Bhagawati	-	-	-	-	0.2	0.2	2.4	2.8	2.6	3.0
Beg Khola	-	-	2.6	3.0	19.9	23.8	22.9	26.4	45.4	53.2
Doba	1.4	1.8	7.0	8.3	35.9	42.8	73.4	84.8	117.7	137.7
Darmja	0.5	0.6	6.6	7.7	38.6	46.1	353.3	408.2	399.0	462.6
Pakhapani	-	-	2.8	3.3	51.5	61.5	125.1	144.6	179.4	209.4
Jhee	0.5	0.6	0.7	0.9	7.4	8.9	2.1	2.4	10.7	12.8
Ghatan	0.8	1.0	0.4	0.5	4.9	5.8	-	-	6.1	7.3
Kulne Mangali	-	-	0.6	0.8	53.1	63.4	429.7	494.5	483.4	558.7
Dana	-	-	2.9	3.4	27.9	33.4	104.9	121.2	135.7	158.0
Total	4.0	5.0	29.7	35.2	328.5	392.5	1495.4	1725.8	1857.6	2158.5
Timber %	0.2	-	1.5	-	17.7	-	80.5		100.0	
All Wood %	-	0.2	-	1.6	-	18.2	-	80.0	-	100.0

Attachment 2 Table 1-d

MUSTANG CATCHMENT

WOOD VOLUME IN '000 CU. M.

Elevation in '000 Meters

Elevation	Below 1.2		1.2 - 1.8		1.8 - 2.4		Above 2.4		TOTAL	
Panchayat/Volume	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood	Timber	All Wood
Morpha	-	-	-	-	-	-	12.7	14.9	12.7	14.9
Lete	-	-	0.6	0.7	10.4	12.2	37.4	43.8	48.4	56.7
Tukuche	-	-	-	-	-	-	18.9	22.2	18.9	22.2
Kunje	-	-	0.1	0.2	6.2	7.2	43.6	51.1	49.9	58.5
Jomsom	-	-	-	-	-	-	0.2	0.2	0.2	0.2
Muktinath	-	-	-	-	-	-	-	-	-	-
Kowang	-	-	-	-	-	-	27.4	32.2	27.4	32.2
Kagbeni	-	-	-	-	-	-	10.0	11.7	10.0	11.7
Jharkot	-	-	-	-	-	-	1.2	1.4	1.2	1.4
Chhusang	-	-	-	-	-	-	17.6	20.6	17.6	20.6
TOTAL	-	-	0.7	0.9	16.6	19.4	169.0	198.1	186.3	218.4
TIMBER %	-	-	0.4	-	8.9	-	90.7	-	100.0	-
ALL WOOD %	-	-	-	0.4	-	8.9	-	90.7	-	100.0

Attachment 2 Table 2-a

KULEKHANI CATCHMENT

SUPPLY & DEMAND OF WOOD

Volume in '000 Cu. M.

Panchayat	GROWING STOCK		YIELD		DEMAND	SURPLUS (+) DEFICIT (-)	Remarks
	Timber	All Wood	Timber	All Wood			
Kulekhani	69.57	82.64	1.08	1.29	3.55	-2.26	* *
Chitlang	55.25	65.90	0.86	1.03	6.85	-5.82	* *
Palung	22.63	27.02	0.35	0.42	5.20	-4.78	* *
Daman	116.75	139.37	1.81	2.17	5.79	-3.62	* *
Thahachok	43.24	51.54	0.67	0.80	6.50	-5.70	* *
Siameri	49.53	58.84	0.22	0.26	4.30	-4.04	* *
Phakhel	95.12	113.51	1.47	1.77	4.01	-2.24	* *
T O T A L	452.09	538.82	6.46	7.74	36.20	-28.46	* *

N.B: * * more than 50% deficit.

Attachment 2 Table 2-b

DARAUNDI CATCHMENT
SUPPLY & DEMAND OF WOOD
Volume in '000 Cu. M.

Panchayat	GROWING STOCK		YIELD		Demand	Surplus (+) Deficit (-)	Remarks
	Timber	All Wood	Timber	All Wood			
Chhoprak	14.55	20.87	0.29	0.42	5.57	-5.15	* *
Kareswar	4.77	7.37	0.07	0.12	3.58	-3.46	* *
Raniswara	17.08	25.93	0.27	0.41	4.17	-3.76	* *
Barpak	277.26	323.44	4.35	5.10	4.26	+0.84	-
Muchok	3.76	5.44	0.06	0.09	3.27	-3.18	* *
Jaubari	11.95	15.18	0.24	0.30	3.44	-3.14	* *
Deorali	39.14	60.35	0.61	0.94	3.07	-2.13	* *
Taranagar	19.39	29.95	0.30	0.47	3.13	-2.66	* *
Corakhkali	19.24	29.42	0.30	0.46	6.24	-5.78	* *
Taklung	19.55	28.29	0.30	0.44	4.72	-4.28	* *
Khanchok	5.73	8.86	0.09	0.14	6.06	-5.92	* *
Pandrung	5.47	8.46	0.09	0.13	4.74	-4.61	* *
Tako	10.95	16.91	0.17	0.26	5.92	-5.66	* *
Taple	9.76	15.08	0.15	0.24	3.61	-3.37	* *
Harmi	7.22	10.94	0.11	0.17	4.28	-4.11	* *
Appipal	12.21	18.86	0.19	0.29	4.19	-3.90	* *
Palungtar	19.79	30.57	0.31	0.48	5.73	-5.25	* *
Suara	73.23	88.52	1.17	1.42	3.48	-2.06	* *
Simjung	169.51	200.20	2.63	3.12	4.87	-1.75	*
Srimath Kot	18.25	25.36	0.28	0.40	2.88	-2.48	* *
Saurpani	47.04	61.14	0.73	0.95	5.54	-4.59	* *
Bungkot	26.27	40.39	0.44	0.68	5.82	-5.14	* *
Bhogteni	30.47	45.46	0.47	0.71	3.75	-3.04	* *
Cairung	19.06	28.19	0.30	0.44	4.08	-3.64	* *
Mankamana	24.78	37.90	0.38	0.59	3.29	-2.70	* *
Dhuwakot	17.42	26.92	0.27	0.42	2.41	-1.99	* *
Mirkot	26.31	40.63	0.41	0.63	3.64	-3.01	* *
Gaikhur	19.49	30.10	0.30	0.47	3.87	-3.40	* *
Khoplang	19.23	29.70	0.30	0.46	4.38	-3.92	* *
TOTAL	988.88	1310.44	15.58	20.75	123.99	-103.24	* *

N.B. * Less than 50% deficit.

* * More than 50% deficit.

Attachment 2 Table 2-c

MYAGDI CATCHMENT

Supply and Demand of Wood

Volume in '000 cu. m.

Panchayat	Growing Stock Timber	Growing Stock All Wood	Yield Timber	Yield All Wood	Demand	Surplus (+) Deficit (-)	Remarks
Ranche	74.3	86.9	1.15	1.35	3.32	-1.97	**
Hinthan Mandalli	136.4	158.5	2.11	2.48	2.57	-0.09	*
Sikha Adarsa	87.0	100.9	1.35	1.58	4.73	-3.15	**
Baraho	167.8	195.1	2.60	3.04	2.59	+0.45	
Pipale	12.1	14.4	0.10	0.23	3.16	-2.93	**
Bhagawati	2.6	3.0	0.05	0.05	3.16	-3.10	**
Beg Khola	45.4	53.2	0.70	0.83	1.95	-1.12	**
Doba	117.7	137.7	1.83	2.15	2.01	+0.14	
Darnija	399.0	462.6	6.18	7.21	3.33	+3.88	
Pakhapani	179.4	209.4	2.79	3.25	2.33	+0.92	
Jhee	10.7	12.8	0.17	0.20	2.82	-2.62	**
Chaten	6.1	7.3	0.10	0.11	2.84	-2.73	**
Kuine Mangale	483.4	558.7	7.49	8.69	1.90	+6.79	
Dana	135.7	158.0	2.10	2.47	2.62	-0.15	*
Total	1857.6	2158.5	22.8	33.65	39.33	-5.68	

N.B.: * Less than 50% deficit
** More than 50% deficit

Attachment 2 Table 2-d

MUSTANG CATCHMENT

SUPPLY & DEMAND OF WOOD

Volume in '000 Cu. m.

Panchayat	GROWING STOCK		YIELD		DEMAND	Surplus (+) Deficit (-)	Remarks
	Timber	All Wood	Timber	All Wood			
Marpha	12.7	14.9	.20	.24	1.17	-0.93	**
Lete	48.4	56.7	.75	.88	0.86	+0.02	-
Tukuche	18.9	22.2	.30	.35	0.65	-0.30	*
Kunje	49.9	58.5	.77	.91	0.83	+0.08	-
Jomsom	0.2	0.2	.00	.00	2.20	-2.20	**
Muktinath	-	-	-	-	0.84	-0.84	**
Kowang	27.4	32.2	.42	.50	0.82	-0.32	*
Kagbeni	10.0	11.7	.16	.18	1.03	-0.85	**
Jharkot	1.2	1.4	.02	.03	0.56	-0.53	**
Chhusang	17.6	20.6	.07	.32	1.17	-0.85	**
TOTAL	186.3	218.4	2.69	3.41	10.13	-6.72	

N.B. * Less than 50% deficit.
** More than 50% deficit.

Attachment 3 Table 1a

KULEKHANI CATCHMENT
Forestry Component
Summary of Activities

	Particulars	Unit	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	G Total
1.	Building	No.		13	5			18													18
	a. Forest Project Office			1				1													1
	b. Officers Quarters			1				1													1
	c. Staff Quarter			1				1													1
	d. Ranger Office			1				1													1
	e. Ranger Quarter			1				1													1
	f. Forester quarter			3	1			4													4
	g. Forest Guards quarter			4	4			8													8
	h. Central Nursery Store			1				1													8
2.	Nursery Establishment	No.	3	2	1	1	1	8													8
	a. Central Nursery		1					1													1
	b. Panchayat Nursery		2	2	1	1	1	7													7
3.	Establishment of Panch. Forest	Ha	12	32	64	91	116	315	125	113	93	73	49	453	25					25	793
	a. Fuelwood		6	16	32	45.5	58	157.5	62.5	56.5	46.5	36.5	24.5	226.5	12.5					12.5	396.5
	b. Fodder		6	16	32	45.5	58	157.5	62.5	56.5	46.5	36.5	24.5	226.5	12.5					12.5	396.5
4.	Establishment of P. Protected Forest	Ha	500	500	250	250	250	1750													1750
5.	Distribution of seedling for community and Individual Planting	'000 No.	6.6	26.9	50	69.3	87.4	240.2	76.5	68.3	60.1	54.6	49.1	308.6	46.4	46.4	46.4	46.4	46.4	232	780.8
6.	Research Trial Plots	No.	-	10	15	20	20	65	10	10	10	10	10	50	10	10	10	10	10	10	165
7.	Forest Demarcation	Km.	60	135	160	170	185	710	225	250	250	250	250	1225							1935
8.	Estab. of National F. Plantation	Ha		25	50	75	75	225	75	40	50	40	-	205							430
9.	Prep. of Forest Management Plan	Ha		9121	500	250	250	10121	250					250							10371
	a. National Forest			8621	X	X	X	8621	X					X							8621
	b. Panchayat Protected Forest			500	500	250	250	1500	250					250							1750
10.	Implement. of Management Plan	Ha			9121	9621	9871	9871	10121	10 371	10371	10371	10371	10371	10371	10371	10371	10371	10371	10371	10371 Cum
	a. National Forest				8621	8621	8621	8621	8621	8621	8621	8621	8621	8621	8621	8621	8621	8621	8621	8621	8621 "
	b. Panch. Protected Forest				500	1000	1250	1250	1500	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750 "
11.	Establishment of Demons. Saw. Mill	No.		1					1												1
12.	Charcoal Pilot Study	No.								1					1						1
13. 1/	Local Training	No.	4	2	1	1	1	9													9
2/	a. Nurseryman		2					2													2
	b. Panchayat Nurseryman		2	2	1	1	1	7													7

N.B. 1/ 4 weeks each
2/ For central nursery and national plantation
for detail see

DARAUNDI CATCHMENT
Forestry Compor.nt
Summary of Activities

Attachment 3 Table 1b

Particulars	Unit	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	G. Total
1. Building	No.		17	1			18													18
a. Forest Project Office			1				1													1
b. Officers quarter			1				1													1
c. Staff quarters			1				1													1
d. Range Office			1				1													1
e. Range quarters			1				1													1
f. Forester quarter			3	1			4													4
g. Forest guards quarter			4	4			8													8
h. Central Nursery Store			1				1													1
2. Nursery establishment	No.	4	3	4	4	3	18	4	4	4			12							30
a. Central Nursery		1					1													1
b. Panchayat Nursery		3	3	4	4	3	17	4	4	4			12							29
3. Establishment of Panchayat Forest	Ha	8	30	66	108	142	354	192	237	286	371	383	1469	371	315	258	94	-	1038	2861
a. Fuelwood		4	15	33	54	71	177	96	118.5	143	185.5	191.5	734.5	185.5	157.5	129	47		519	1430.5
b. Fodder		4	15	33	54	71	177	96	118.5	143	185.5	191.5	734.5	185.5	157.5	129	47		519	1430.5
4. Establishment of P. Protected Forest	Ha	738	677	1000	1000	750	4165	1000	1000	1000			3000							7165
5. Distribution of seedlings for community & individual planting	'000	11.4	38.6	53.2	94.5	122.8	330.5	131	136.4	141.9	150.1	155.6	715	158.3	158.3	158.3	158.3	158.3	791.5	1837
	No.		10	15	20	20	65	15	15	15	15	15	75	15	15	15	15	15	75	215
6. Research Trial Plots	No.																			
7. Forest demarcation	Km	60	135	220	305	345	1065	500	500	500	500	500	2500	600	600	600	600	600	3000	6565
8. Estab. of National F. Plantation	Ha		80	160	265	320	825	220	280	300	300	290	1390	280	280	300	320	320	1500	3715
9. Prep. of Forest Management Plan	Ha		26408	677	1000	1000	3415	750	1000	1000	1000		3750							32830
a. National Forest			25670																	25670
b. Panchayat Protected Forest			738	677	1000	1000	3415	750	1000	1000	1000		3750							7165
10. Implement. of Management Plan	Ha			26408	27085	28085	28085	29085	29835	30835	31835	32835	32835	32835	32835	32835	32835	32835	32835	32835 Cum
a. National Forest				25670	25670	25670	25670	25670	25670	25670	25670	25670	25670	25670	25670	25670	25670	25670	25670	25670 "
b. Panch. Protected Forest			7	738	1415	2415	2415	3415	4165	5165	6165	7165	7165	7165	7165	7165	7165	7165	7165	7165 "
11. Establishment of Dmona. Saw Mill	No.			1			1													1
12. Charcoal Pilot Study	No.								1				1							1
13. 1/Local Training	No.	8	3	4	4	3	22	4	4	4			12							34
2/a. Nurseryman		5					5													5
b. Panchayat nurseryman		3	3	4	4	3	17	4	4	4			12							29

1/ 4 weeks each
2/ For central nursery and national plantation
for detail see appendix 1b.

Attachment 3 Table 1-c

MYACDI CATCHMENT
Forestry Component
Summary of Activities

Particulars	Unit	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	G. Total
1. Building	No.			8	9	7	24	8					8							32
a. Forest Project Office				1			1													1
b. Officers quarter				1			1													1
c. Staff quarter				1			1													1
d. Range Office				1	1		2													2
e. Range Office				1	1		2													2
f. Forester quarter				2	3	3	8													8
g. Forest Guards quarter					4	4	8	8					8							16
h. Central Nursery Store				1			1													1
2. Nursery Establishment	No.	3	2	2	2	2	11	2	2				4							15
a. Central Nursery		1					1													1
b. Panchayat Nursery		2	2	2	2	2	10	2	2				4							14
3. Establishment of Panchayat Forest	No.		16	38	54	76	184	110	142	184	212	206	854	194	150	136	96	28	604	1642
a. Fuelwood			8	19	27	38	92	55	71	92	106	103	427	97	75	68	48	14	302	821
b. Fodder			8	19	27	38	92	55	71	92	106	103	427	97	75	68	48	14	302	821
4. Establish. of Panch. Protected Forest	No	500	393	262	500	500	2155	500	500				1000							3155
5. Distribution of seedlings for community & individual plantings	'000 No.		11.8	25	35.7	49.1	121.6	49.1	51.9	54.6	51.9	51.9	259.4	49.2	49.2	49.2	49.2	49.2	246	627
6. Research Trial Plots	No.		10	15	20	20	65	12	12	12	12	12	60	12	12	12	12	12	60	185
7. Forest Demarcation	Km.	60	135	220	305	345	1065	400	400	400	500	500	2200	500	500	500	600	600	2700	5965
8. Establish. of Nation. F. Plant.	No		100	200	320	325	945	300	310	310	330	315	1565	320	320	300	290	290	1520	4030
9. Prep. of Forest Management Plan	No.			27395	615	540	28550	500	500	500			1500							30050
a. National Forest				26895			26895													26895
b. Panchayat Protected forest				500	615	540	1655	500	500	500			1500							3155
10. Implement. of Mgmt. Plan	No				27395	28010	28010	28550	29050	29550	30050	30050	30050	30050	30050	30050	30050	30050	30050	30050 Cum
a. National forest					26895	26895	26895	26895	26895	26895	26895	26895	26895	26895	26895	26895	26895	26895	26895	26895 "
b. Panchayat Protected Forest					500	1115	1115	1655	2155	2655	3155	3155	3155	3155	3155	3155	3155	3155	3155	3155 "
11. Establ/of/Demonst/Sml/Mill	No.				1		1													1
12. Charcoal Pilot Study	No.									1			1							1
13. 1/Local Training	No.	7	2	2	2	2	15	2	2				4							19
2/a. Nursery man		5					5													5
b. Panchayat nursery man		2	2	2	2	2	10	2	2				4							14

N.B. 1/ 4 weeks each
2/ for central nursery and national plantation
for detail see Attachment 1-c.

Attachment 3 Table 1-d

MUSTANG CATCHMENT
Forestry Component
Summary of Activities

Particulars	Unit	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	G. Total
1. Building	No.			8	9	7	24	8					8							32
a. Forest Project Office				1			1	1					1							1
b. Officers' quarters				1			1	1					1							1
c. Staff Quarters				1			1	1					1							1
d. Range Office				1	1		2	2					2							2
e. Range Quarter				1	1		2	2					2							2
f. Forester quarter				2	3	3	8	8					8							8
g. Forest Guards' quarter					4	4	8	8					8							16
h. Central Nursery Store				1			1													1
2. Nursery Establishment	No.	3	2	2	1	1	9	1	1				2							11
a. Central Nursery		1					1													1
b. Panchayat Nursery		2	2	2	1	1	8	1	1				2							10
3. Estab. Panch. Forst.	Ha	5	12	25	43.5	61.5	147	70	78	85	90	99	422	102	92	68	70	60	392	961
a. Fuelwood		2.5	6	12.5	23	33	77	35	39	42.5	45	49.5	211	51	46	34	35	30	196	484
b. Fodder		2.5	6	12.5	20.5	28.5	70	35	39	42.5	45	49.5	211	51	46	34	35	30	196	477
4. Establishment of Panch. Pro. Forest	Ha.	250	250	250	193	250	1193	250	250	250			750							1943
5. Distr. seedlings for community & individual planting	'000 No.	2	6.7	8.8	10.5	13.7	41.7	16.4	16.4	16.4	16.4	16.4	82	19.1	19.1	19.1	19.1	19.1	95.5	219.2
6. Research Trial Plots	No.		10	15	20	20	65	12	12	12	12	12	60	12	12	12	12	12	60	185
7. Forest Demarcation	Km.	60	75	100	100	125	460	125	150	150	150	150	725	150	150	150	150	150	750	1935
8. Establishment of Nat. F. Plantation	Ha		20	60	120	160	360	160	160	160	160	140	780	220	200	260	280	280	1240	2380
9. Prep. of Forest Management Plan	Ha			6898	250	193	7341	250	250	250	250		1000							8341
a. National Forest				6398			6398													6398
b. Panchayat Protected Forest				500	250	193	943	250	250	250	250		1000							1943
10. Implement. of Management Plan	No.				6898	7148	7148	7341	7591	7841	8091	8091	8341	8341	8341	8341	8341	8341	8341	8341 Cum.
a. National Forest					6398	6398	6398	6398	6398	6398	6398	6398	6398	6398	6398	6398	6398	6398	6398	6398 "
b. Panchayat Protected Forest					500	750	750	943	1193	1443	1693	1693	1693	1943	1943	1943	1943	1943	1943	1943 "
11. Establishment of Demons. Saw. Mill	No.					1	1													1
12. Charcoal Pilot Study	No.										1		1							1
13. 1/Local Training	No.	4	3	2	1	1	11	1	1			2	4							15
2/a. Nursery Man		2	1				3					2	4							5
b. Panchayat Nurseryman		2	2	2	1	1	8	1	1				2							10

N.B. 1/ 4 weeks each
2/ For central nursery and national plantation
For detail see Attachment 1-d.

Attachment 4

Determination of nursery size

No. of plants for fuel wood plantation	= 10X2500	= 25000
No. of plants for fodder plantation	= 10X816	= 8160
		33160
No. of plants for distribution		= 10000
For Casualty replacement 25% of 33160		= 8290
	Total seedlings	= 51450

Including 25% mortality in nursery of plants = 64313

Say = 70,000

Area of Transplant seed = $\frac{70000 \times 3.1416 \times 3.75 \times 3.75}{10000}$

= 310 Sqm.

Seed bed = 20 Sqm.

Total effective area = 330 Sqm.

Including Path, Terraces etc.
the total area = 660 Sqm.

For store = 50 Sqm.

Working space = 165 Sqm.

The total area of nursery = 875 Sqm.

Say 900 Sqm.

= 09 Hectare.

NURSERY INFORMATION ON RECOMMENDED SPECIES

Attachment 5 Page 1

Botanical Name	Local Name	Cutting or seed	Collecting season	Seed viability raising plants	Season for raising plants	Duration in Nursery	Remarks
Abies spectabilis	Raisallo	S	Nov - Jan	6 mths	March - Apr	18	
Acer oblongum	Phirfire	S	Feb - March	6 mths	March - Apr	10	
Acer spp.	Phangaro	S	June - Aug	-	August	15	
Alnus nepalensis	Utis	S	Dec - March	3 wks	March	5	
Artocarpus lakoucha	Bedahar	S	June - July	1 week	June - July	12	
Arundinaria spp.	Nigalo	S/C	July - Aug		August	12	
Bambusa spp.	Thulo Bans	S/C	July - Aug		August		
Bahinia Purpurea	Tanki	S	Feb - Apr	12 mths	March - April	12	
Bahinia Veriegata	Koiralo	S	Mar - May	12 mths	March - April	12	
Betula alnoides	Saur	S	Sep - Dec	4 mths	March	5	
Betula utilis	Bhojpatre	S	August		March	15	
Brassiopsis glomerulata	Kalo-Chuletro	S/C	June - July	12 mths	May - July	12	
Brassiopsis hainla	Seto-Chuletro	S	March - June	12 mths	July - Aug	10	
Dendrocalamus spp.	Bans	S/C	July				
Erythrine arborescens	Phaledo	S/C	Dec - Apr	5 yrs	Feb	6	
Ficus foleoleta	Dewaro	C	Feb - March		Feb - March	6/15	
Ficus hispida	Khasreto	S	July	1 yr	July	12	
Ficus lacor	Kavro	C	Feb		Feb	8	
Ficus nemoralis	Dudhilo	S/C	June - Aug	1 yr	July - Aug	2	
Ficus roxburghii	Nimaro	S/C	June - Sep	1 yr	July	12	

NURSERY INFORMATION ON RECOMMENDED SPECIES

Botanical Name	Local Name	Cutting or seed	Collecting season	Seed viability raising plants	Season for raising plants	Duration in Nursery	Remarks
Ficus semicotata	Khanyu	S	June - Aug	1 yr	July	12	
Fraxinus floribunda	Lahuri	S	Dec - Jan	9 mths	March	15	
Grewia oppobutifolia	Syal Fuare	S	June - Sep		July - Aug	10	
Litsea citrata	Sil Timur	S	Aug - Nov	1 mth	Aug - Sep	12	
Litsea monopetala	Kutmero	S	June - Aug	1 mth	July	12	
Machilus gamblii	Kathe Koulo	S	Nov - Dec		March	15	
Morus alba	Kimbu	C	Feb		Feb	6	
Pinus roxburghii	Ranisello	S	Dec - March	2-3 yrs	August	10	
Pinus wallichiana	Gobre Sallo	S	Oct - Jan	2-3 yrs	August	12	
Populus ciliata	Bhote Pipal	C	Feb				
Prunus cerasoides	Paimyu	S	Mar - May	12 mths	May	12	
Salix spp.	Baino	C	Feb		Feb	5	
Smorania nepalensis	Gogon	S	Mar-Apr Sep-Nov	12 mths	March - April	10	
Sorbus spp.	Mayal	S/C	Sep - Nov		March	8	
Symplocos crategoides	Kholnae	S	Mar-June-Aug		August	10	
Choerospondias axillaris	Lapsi	S	Oct - Nov	12 mths	March	12	
Melia azadirach	Bakaino	S	Nov - Dec	6 mths	March	5	
Celtis australis	Khari	S	June - Sep		Aug - Sept	6	
Albizzia procera	Seto Siris	S	Nov - Jan		March	6	
Albizzia stipulata	Siris	S	Sep - Oct		March	6	
Cedrela toona	Tuni	S	June - July		Feb - March	5	

NURSERY INFORMATION ON RECOMMENDED SPECIES

Botanical Name	Local Name	Cutting or seed	Collecting season	Seed viability raising plants	Season for raising plants	Duration in Nursery	Remarks
Terminelia belerica	Barro	S	Dec - Feb		Feb - March	6	
Terminelia tomentosa	Asna	S	Feb - April		Feb - March	6	
Adina cordifolia	Karma	S	Nov - Jan		Feb - March	6	
Anthocephalus cadamba	Kadam	S	-		Feb - March	5	
Michalia champaca	Champ	S	July - Aug		Aug - Sept	10	
Bunganga grandiflora	Lampate	S	-		-		
Grevillea robusta	Kangyo	S	May - June		Aug - Sept	8	
Boscia butyracea	Cheuri	S	June - July				
Callistemon viminalis	Kalki	S/C	Aug - Sept		Feb - March	5	
Sapindus Mukurosii	Ritha	S	Oct - Jan		Feb - March	6	
Buddleia asiatica	Bhimsenpati	S	May - June		Feb - March	6	
Callicarpa tomentosa	Guyelo	S	Nov - Jan		Feb - March	6	
Dioospyros Pepo	Timu	S	-		Feb - March	6	
Juglans Regia	Chhar	S	Sept - Oct		March - April	15	
Cupressus torulosa	Dhupisallo	S	Oct - Nov		March - April	10	
Juniperus Spp.	Dhupi	S	-		-	-	
Aesculus indica	Lampate Phangaro		Aug - Nov		March - April	10	
Cordia arabica	Gouian	S	May - June		Feb - March	6	
Bombax ceiba	Simel	S/C	March - April		Feb - March	6	

Attachment 6

RECOMMENDED SPECIES FOR PLANTATION

Below 1200 meters

a. Fuelwood

Botanical Name	Local Name
Melia azedirach	Bakaino
Grevillea robust	Kangyo
Albizzia procera	Seto-Sirish
Terminalia tomentosa	Asna
Terminalia belerica	Barro
Adina cordifolia	Karma
Mytragyna parvifolia	Faldu
Hyminodictyon excelsum	Bhurkul
Lagerstroemia parviflora	Botdhairo
Anogeissus latifolio	Bajhi
Anthocephalus cadamba	Kadam
Bassia latifolia	Mahuwa
Cedrela toona	Tuni
Alnus nepalensis	Utis

b. Fodder

Botanical Name	Local Name
Bassia butyracea	Cheuri
Arundinaria spp.	Nigalo
Dendrocalamus spp.	Bans
Ficus roxburghii	Newaro
Morus alba	Kimbu
Erythrina arborescens	Phaledo
Ficus lacor	Kavro
Bauhinia variegata	Koiralo
Artocarpus lakoocha	Badahar
Grewia oppositifolia	Syc Fusre
Buddleia asiatica	Bhimsenpati
Cedrela toona	Tooni
Terminalia tomentosa	Asna

b. Fodder (cont.)

Botanical Name	Local Name
Terminalia belerica	Berro
Adina cordifolia	Karma
Anthocephalus cadamba	Kadam
Ficus semicordata	Khanyu
Ficus hispida	Khasreto
Litsea monopetala	Kutmiro
Bambusa spp.	Bans

c. Timber and furniture wood

Botanical Name	Local Name
Alnus nepalensis	Utis
Cedrala toona	Toon
Omelina arborea	Gamari
Albizzia procera	Seto-Sirish
Terminalia belerica	Berro
Adina cordifolia	Karma
Antocephalus cadamba	Kadam
Michelia champaca	Champ
Duabanga somerasoides	Lampate
Pinus roxburghii	Rani sallo
Grevillea robusta	Kangiyo
Terminalia tomentosa	Asna

From 1200 - 1800 meters

a. Fuelwood

Botanical Name	Local Name
Pinus roxburghii	Khote sallo, Rani sallo
Salix spp.	Bais
Alnus nepalensis	Utis
Betula alnoides	Saur
Prunus cerasoides	Paiyun
Callistemon viminalis	Kalki
Melia azedirach	Bakaino
Sapindus mukurosii	Ritha

From 1200 - 1800 meters

a. Fuelwood (cont.)

Grevillea robusta	Kangiyo
Choreospondias axillaris	Labsi
Albizzia stipulata	Siris
Acer eblongum	Firfire
Litsea eitrata	Siltumur
Fraximus floribunda	Lakuri
Erythrina arborescens	Phaledo

b. Fodder

Botanical Name	Local Name
Salix spp.	Bais
Arundinaria spp.	Nigalo
Populus ciliata	Bhote Pipal
Sorbus spp.	Mayal
Betuila alnoides	Saur
Brassiopsis glomerulata	Kale Chuletro
Dendrocalamus spp.	Bans
Ficus lacor	Kabro
F. foveolata	Timio
F. roxburghii	Nemarro
F. Semicordata	Khanyu
Morus alba	Kimbu
Sauraria nepalensis	Gogan
Erythrina arborescens	Phaledo
Celtis australis	Khari
Bauhinia Purpurea	Tanki
F. nemoralis	Dudhilo
Buddleia asiatica	Bhimsenpati
Albizzia stipulata	Siris
Calicarpa tomentosa	Guyelo
F. hispida	Khasreto
Prunus cerasoides	Paiyun
Acer oblongum	Firfire
Brassiopsis hainla	Seto chuletro

b. Fodder (cont.)

Botanical Name	Local Name
Litsea monopetala	Kutuiro
Machilus gamblei	Kaulo
Symplocos cratazoides	Kholme
Bambusa spp.	Thulo Bans
Diospyres pepo	Tinu

c. Timber and furniture wood

Botanical Name	Local Name
Pinus roxburghii	Rani Sallo
Sapindus microsii	Ritha
Grevillea robusta	Kangiyo
Choreosporidias axillaris	Labsi
Albizzia stipulata	Sirish
Michelia champaca	Champ
Juglans fegia	Okhar
Alnus nepalensis	Utis
Acer oblongum	Firfire

From 1800 - 2400 meters

a. Fuelwood

Botanical Name	Local Name
Pinus wallichiana	Gobre sallo
Alnus nepalensis	Utis
Prunus cerasoides	Paiyun
Cuppressus torulosa	Dhupi sallo
Acer spp.	Phangaro
Aesculus Indica	Lampate
Betula alnoides	Saur
Salix	Bais

b. Fodder

Betula alnoides	Saur
Arundinaria spp.	Nigalo
Sorbus spp.	Mayal
Salix spp.	Bais

From 1800 - 2400 meters

b. Fodder (cont.)

Botanical Name	Local Name
Populus ciliata	Rhote Pipal
Buddleia asiatica	Bhimsenpati
Ficus foveolata	Timilo
Ficus hispida	Khasreto
Prunus cerasoides	Paiyun
Acer spp.	Phangaro

c. Timber and furniture wood

Botanical Name	Local Name
Pinus wallichiana	Gobre Sallo
Alnus nepalensis	Utis
Cuppressus torulosa	Dhupi sallo
Juglans regia	Okhar
Acer spp.	Phangaro
Aesculus Indica	Lampate Phangaro

Above 2400 meters

a. Fuelwood

Botanical Name	Local Name
Betula utilis	Bhojpatra
Abies spectabilis	Rai Sallo
Picca smithiana	Sallo
Acer spp.	Phangaro
Juniperus spp	Dhupi

b. Fodder

Betula utilis	Bhojpatra
Acer spp.	Phangaro
Arundinaria spp	Nigalo
Populus ciliata	Bhote pipal
Machilus gamblie	Kaulo
Sorbus spp.	Mayal
Salix spp	Bais

Above 2400 meters

c. Timber and Furniture wood (cont.)

Botanical Name	Local Name
Abies spectablis	Rai Sallo
Picea smithiana	Sallo
Juniperus spp.	Dhupi
Tsuga dumosa	-
Larix spp.	Larch
Acer spp.	Phangaro

RECOMMENDED SPECIES FOR PLANTATION

Below 1200 meters

a. Fuelwood

Botanical Name	Local Name
Melia azedirach	Bakaino
Grevillea robusta	Kangyo
Albizzia procera	Seto-Sirish
Terminalia tomentosa	Asna
Terminalia belerica	Barro
Adina cordifolia	Karma
Mytragyna parvifolia	Faldu
Hyminodictyon excelsum	Bhurkul
Lagerstroemia parviflora	Botdhairo
Anogeissus latifolio	Bajhi
Anthocephalus cadamba	Kadam
Bassia latifoia	Mahuwa
Cedrela toona	Tuni
Alnus nepalensis	Utis

b. Fodder

Botanical Name	Local Name
Bassia butyracea	Cheuri
Arundinaria spp.	Nigalo
Dendrocalamus spp.	Bans
Ficus roxburghii	Newaro
Morus alba	Kimbu

b. Fodder (cont.)

Botanical Name	Local Name
Erythrina arborescens	Phaledo
Ficus lacor	Kavro
Bauhinia variegata	Koiralo
Artocarpus lakoocha	Badahar
Grewia oppositifolia	Syc Fusre
Buddleia asiatica	Bhimsenpati
Cedrela toona	Tooni
Terminalia tomentosa	Asna
Terminalia belerica	Barro
Adina cordifolia	Karma
Anthocephalus cadamba	Kadam
Ficus semicordata	Khanyu
Ficus hispida	Khasreto
Litsea monopetala	Kutmiro
Bambusa spp.	Bans

c. Timber and furniture wood

Botanical Name	Local Name
Alnus napalensis	Utis
Cedrela toona	Toon
Gmelina arborea	Gamari
Albizzia procera	Seto-Sirish
Terminalia belerica	Barro
Adina cordifolia	Karma
Antocephalus cadamba	Kadam
Michelia champaca	Champ
Duabanga sonerasoides	Lampate
Pinus roxburghii	Rani sallo
Grevillea robusta	Kangiyo
Terminalia tomentosa	Asna

From 1200 - 1800 meters

a. Fuelwood

Botanical Name	Local Name
Pinus roxburghii	Khote sallo, Rani sallo
Salix spp.	Bais
Alnus nepalensis	Utis
Betula alnoides	Saur
Prunus cerasoides	Paiyun
Callistemon viminalis	Kalki
Melia azedirach	Bakaino
Sapindus mukurosii	Ritha
Grevillea robusta	Kangiyo
Choreospondias axillaris	Labsi
Albizzia stipulata	Siris
Acer oblongum	Firfire
Litsea citrata	Siltumur
Fraxinus floribunda	Lakuri
Erythrina arborescens	Phaledo

b. Fodder

Botanical Name	Local Name
Salix spp.	Bais
Arundinaria spp.	Nigalo
Populus ciliata	Bhote Pipal
Sorbus spp.	Mayal
Betula alnoides	Saur
Brassiopsis glomerulata	Kalo Chuletro
Dendrocalamus spp.	Bans
Ficus lacor	Kabro
F. foveolata	Timio
F. roxburghii	Nemarro
F. Semicordata	Khanyu
Morus alba	Kimbu
Sauraria nepalensis	Gogan
Erythrina arborescens	Phaledo

b. Fodder (cont.)

Botanical Name	Local Name
Celtis australis	Khari
Bauhinia Purpurea	Tanki
F. nemoralis	Dudhilo
Buddleia asiatica	Bhimsenpati
Albizzia stipulata	Siris
Calicarpa tomentosa	Guyelo
F. hispida	Khasreto
Prunus cerasoides	Paiyun
Acer oblongum	Firfire
Brassiopsis hainla	Seto chuletro
Litsea monopetala	Kutmiro
Machilus gamblei	Kaulo
Symplocos cratazoides	Kholme
Bambusa spp.	Thulo Bans
Diospyros pepo	Tinu

c. Timber and furniture wood

Botanical Name	Local Name
Pinus roxburghii	Rani Sallo
Sapindus mucrosii	Ritha
Grevillea robusta	Kangiyo
Choreospondias axillaris	Labsi
Albizzia stipulata	Sirish
Michelia champaca	Champ
Juglans fegia	Okhar
Alnus nepalensis	Utis
Acer oblongum	Firfire

From 1800 - 2400 meters

a. Fuelwood

Botanical Name	Local Name
Pinus wallichiana	Gobre sallo
Alnus nepalensis	Utis
Prunus cerasoides	Paiyun

From 1800 - 2400 meters (cont.)

a. Fuelwood

Botanical Name	Local Name
Cuppressus torulosa	Dhupi sallo
Acer spp.	Phangaro
Aesculus Indica	Lampate
Betula alnoides	Saur
Salix	Bais

b. Fodder

Betula alnoides	Saur
Arundinaria spp.	Nigalo
Sorbus spp.	Mayal
Salix spp.	Bais
Populus ciliata	Bhote Pipal
Buddleia asiatica	Bhimsenpati
Ficus foveolata	Timilo
Ficus hispida	Khasreto
Prunus cerasoides	Paiyun
Acer spp.	Phangaro

c. Timber and furniture wood

Botanical Name	Local Name
Pinus wallichiana	Gobre Sallo
Alnus nepalensis	Utis
Cuppressus torulosa	Dhupi sallo
Juglans regia	Okhar
Acer spp.	Phangaro
Aesculus Indica	Lampate Phangaro

Above 2400 meters

a. Fuelwood

Botanical Name	Local Name
Betula utilis	Bhojpatra
Abies spectabilis	Rai Sallo
Picca smithiana	Sallo
Acer spp.	Phangaro
Juniperus spp	Dhupi

Above 2400 meters

b. Fodder

Botanical Name	Local Name
Betula utilis	Bhojpatra
Acer spp.	Phangaro
Arundinaria spp.	Nigalo
Populus ciliata	Bhote pipal
Machilus gamblie	Kaulo
Sorbus spp.	Mayal
Salix spp.	Bais

c. Timber and Furniture wood

Abies spectablis	Rai Sallo
Picea smithiana	Sallo
Juniperus spp.	Dhupi
Tsuga dumosa	-
Larix spp.	Larch
Acer spp.	Phangaro

EXOTIC SPECIES

Recommend for Trials

a. Fuelwood

Acacia decurrens

Acacia mearnsii - Syn. A. mollissima

Cryptomeria japonica

Leucaena leucocephala

Robinia - pseudoacacia

Sesbania spp.

Prosopis juliflora

b. Fodder

Leucaena leucocephala

c. Timber and furniture wood

Auraucaria cunninghamii

Ailanthus excelsa

Pinus caribea

Pinus patula

Pinus kesia

Pinus oocarpa

Pinus tunifolia

Pinus strobus

Pinus pseudo-strobus

Pinus taeda

Pinus elliotii

Platinus orientalis

BUILDING SPECIFICATION

1. Forest Project Office:

		Floor area sq. ft.
Attached Officer	-	180
Ranger	-	144
Clerk	-	120
Store	-	80
Toilet	-	60
Verandah	-	60
Net area	-	644
Circulation 33%	-	215
Plinth area	-	859

Say 860 sq. ft. Rate Rs. 110/sq. ft.

2. Officers' Quarter B type:

Sitting room	-	150
Bedroom	-	150
Bedroom	-	120
Kitchen/Dining	-	150
Toilet	-	50
Store	-	50
		670
Circulation 33%	-	221
		891

Say 900 Rate Rs. 110/sq. ft.

For garage 150 sq. ft.

3. Staff Quarter:

2 rooms	10 x 12 x 2	=	240
2 kitchen	8 x 10 x 2	=	160
2 store	8 x 10 x 2	=	128
1 toilet			50
			578
Circulation 33%		-	193
			771

Say 780 Rate Rs. 100/sq. ft.

4. Range Office)		Rs. 80,000
5. Range Quarter)	Forest department specification	Rs. 50,000
6. Forester Quarter)		Rs. 42,000
7. Forest Guard Quarter)		Rs. 30,000

8. Central Nursery Store:

2 rooms	240
2 rooms	160
store	150
	550
Circulation 33%	181.5
	731.5
	Say 750 Rs. 100/sq. ft.

9. Panchayat Nursery Store:

2 Rooms	160
Store	150
	310
Circulation 33%	102
	412
	Say 420 Rs. 100/sq. ft.

The following cost factor has been used:-

Kulekhani	1.00
Gorkha	1.25
Myagdi	1.50
Mustang	1.75

(Rate supplied by R.C.U. architect)

Attachment 9

LIST OF EQUIPMENT

FIELD:

1. Prismatic Compass with staff
2. Metallic Tape - 100 ft.
3. Abney's Label
4. Diameter Tape, Steel - 20
5. Increment borer
6. Tatum holder
7. Sprayer Hand
8. Pit Saw
9. Cross-cut Saw
10. Repair tools for saws.
11. Altimeter

OFFICE

1. Typewriter
2. Calculating Machine
3. Drawing Instruments

Attachment 10 Table 1-1

Size of Nursery = .09 ha.

KULEKHANI CATCHMENT

Nursery Establishment Programme

Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Remarks
Chitlang	+					1	
Kulekhani	+					1	
Pilung		+				1	
Daman		+				1	
Thahachok			+			1	
Sisneri				+		1	
Phakhel					+	1	
Total No. of Nursery	2	2	1	1	1	7	

Attachment 10 Table 1-2

Size of Nursery - .09 Ha.

Daraundi Catchment

Nursery Establishment Schedule

Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	TOTAL	G. TOTAL
Chlograk	+								1	
Mareswar	+								1	
Ramiswara	+								1	
Barpak		+							1	
Muchok		+							1	
Jaibari		+							1	
Deorali			+						1	
Taranagar			+						1	
Corakh Kali			+						1	
Takluug			+						1	
Khamchok				+					1	
Pandrung				+					1	
Tako				+					1	
Taple				+					1	
Nami					+				1	
Appipal					+				1	
Palungtar					+				1	
Swara						+			1	
Simjung						+			1	
Srinath Kot						+			1	
Saurpani						+			1	
Bunghot							+		1	
Bhogteni							+		1	
Chairung							+		1	
Mankamana							+		1	
Dhuwahot								+	1	
Mirhot								+	1	
Gaikhur								+	1	
Khoplang								+	1	
Total No. of Nurseries	3	3	4	4	3	4	4	4	29	

MYAGDI CATCHMENT

Nursery Establishment Schedule

Size of Nursery .09 Ha.

Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Year 6	Year 7	Grand Total
Pakhapani	+					1			1
Bekhola	+					1			1
Choltang		+				1			1
Piple		+				1			1
Jhee			+			1			1
Bhagawati			+			1			1
Ramche				+		1			1
Histham Mandali				+		1			1
Sikha Adarsa					+	1			1
Duna					+	1			1
Baraha							+		1
Doha							+		1
Kuine Mangale								+	1
Darmija								+	1
	2	2	2	2	2	10	2	2	14

Attachment 10 Table 1-4

Size of Nursery - .09 Ha.

MUSTANG CATCHMENT

Nursery Establishment Programme

Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Year 6	Year 7	Total	Remarks
Marpha	+								1	
Lete	+								1	
Tukuche		+							1	
Kunje		+							1	
Jomosom			+						1	
Muktinath			+						1	
Lewang				+					1	
Kagbeni					+				1	
Jharkot							+		1	
Chhusang								+	1	
Total Number of Nursery	2	2	2	1	1	8	1	1	10	

KULEKHANI CATCHMENT

Panchayat Plantation Establishment Schedule

Fuelwood/Fodder

Ha. to be planted by year:

Panchayat	Yr1	Yr2	Yr3	Yr4	Yr5	Total	Yr6	Yr7	Yr8	Yr9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Chitland	6	10	10	19	12	50.0	12.5					12.5							62.50
Kulekhani		6	10	10	12	58.0	12.0	12.5				24.5							62.50
Palung			6	7.5	8	21.5													21.50
Daman			6	10	10	26.0	12	12.0	12.5			36.5							62.50
Thahachok				6	10	16.0	10	12	12	12.5		46.5							62.50
Sisneri					6	6	10	10	12	12	12.5	56.5							62.50
Phakhel							6	10	10	12	12	50.0	12.5					12.5	62.50
Total	6	16	32	45.5	58	157.5	62.5	56.5	46.5	36.5	24.5	226.5	12.5					12.5	396.5

Daraundi Catchment

Plantation Establishment Schedule in Panchayat Forest

Fuelwood/Fodder

(Ha)

Panchayat	Hectare to be planted by year																		Grand Total
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	
Chhoprak	4	7	7	7	7	32.0	7	7.5	8	8.0	-	30.5	-	-	-	-	-	-	62.5
Nareswar	-	4	7	7	7	25.0	7	7	7.5	8	8	37.5	-	-	-	-	-	-	62.5
Raniswara	-	4	7	7	-	18.0	-	-	-	-	-	-	-	-	-	-	-	-	18.0
Barpak	-	-	4	7	7	18.0	7	7	7	7.5	8	36.5	8	-	-	-	-	8.0	62.50
Muchok	-	-	4	7	7	18.0	7	7	7	7.5	8	36.5	8	-	-	-	-	8.0	62.5
Jaubari	-	-	4	7	7	18.0	7	7	7	7.5	8	36.5	8	-	-	-	-	8.0	62.5
Deorali	-	-	-	4	7	11.0	7	-	-	-	-	7.0	-	-	-	-	-	-	18.0
Taranagar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gorakh Kali	-	-	-	4	6	10.0	7	7	-	-	-	14.0	-	-	-	-	-	-	24.0
Taklung	-	-	-	4	7	11.0	7	7	7	7	7.5	35.5	8	8	-	-	-	16.0	62.50
Khanchok	-	-	-	-	4	4.0	7	7.	7	7	7	35.0	7.5	8	8	-	-	23.5	62.5
Pandrung	-	-	-	-	4	4.0	7	7	7	7	7	35.0	7.5	8	8	-	-	23.5	62.5
Tako	-	-	-	-	4	4.0	7	7	7	7	7	35.0	7.5	8	8	-	-	23.5	62.5
Taple	-	-	-	-	4	4.0	7	7	7	7	7	35.0	7.5	8	8	-	-	23.5	62.5
Harai	-	-	-	-	-	-	4	7	7	7	7	32.0	7	7	8	8	-	30.0	62.0
Appipal	-	-	-	-	-	-	4	8	8	8	-	28.0	-	-	-	-	-	-	28.0
Palungtar	-	-	-	-	-	-	4	6	6.5	7	7	30.5	3.0	-	-	-	-	3.0	33.5
Swara	-	-	-	-	-	-	-	5	7.5	10	10	32.5	10	10	10	-	-	30.0	62.5
Simjung	-	-	-	-	-	-	-	5	7.5	10	10	32.5	10	10	10	-	-	30.0	62.5
Srinath Kot	-	-	-	-	-	-	-	5.	7.5	10	10	32.5	10	10	10	-	-	30.0	62.5
Saurpani	-	-	-	-	-	-	-	5	7.5	10	10	32.5	10	10	2.5	-	-	22.5	55.0
Bungkot	-	-	-	-	-	-	-	-	5	7.5	10	22.5	10	10	10	10	-	40.0	62.5
Bhogteni	-	-	-	-	-	-	-	-	5	7.5	10	22.5	10	10	10	4.5	-	34.5	57.0
Chairung	-	-	-	-	-	-	-	-	5	7.5	10	22.5	10	10	10	10	-	40.0	62.5
Mankamana	-	-	-	-	-	-	-	-	5	7.5	10	22.5	10	10	10	10	-	40.0	62.5
Dhuwakot	-	-	-	-	-	-	-	-	-	5	7.5	12.5	10	10.5	-	-	-	20.5	33.0
Mirkot	-	-	-	-	-	-	-	-	-	5.	7.5	12.5	10	10	10	4.5	-	34.5	47.0
Gaikhur	-	-	-	-	-	-	-	-	-	5	7.5	12.5	10	10	6.5	-	-	26.5	39.0
Khoplang	-	-	-	-	-	-	-	-	-	5	7.5	12.5	6.5	-	-	-	-	6.5	19.0
Total	4	15	33	54	71	177	96	118.5	143	185.5	191.5	734.5	185.5	157.5	129.0	47.0	-	519.0	1430.5

Attachment 10 Table 2a-3

MYAGDI CATCHMENT

Plot^{n} Establishment Schedule in Panchayat Forest

(Fuelwood/Fodder)

Ha. to be planted by year

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	G. Total
Pakhapani		4.0	5.5	5.5	5.5	20.5	7	7	7	7	7	35	7					7	62.50
Beg Khola		4..	5.5	5.5	5.5	20.5	7	7	7	7	7	35	7					7	62.50
Ghotang			4.0	4.0	5.5	13.50	7	7	7	7	7	35	7	7				14	62.50
Piple			4.0	4.0	5.5	13.50	7	7	7	8		29							42.50
Jhee				4.0	4.0	8.0	5.5	7	7	7	7	33.5							41.50
Bhagawati				4.0	4.0	8.0	5.5	7	7	7	7	33.5	8					8	49.50
Ramche					4.0	4.0	4	5.5	7	7	7	30.5	7	7	7	7		28	62.50
Histhan Mandali					4.0	4.0	4	5.5	7	7	7	30.5	7	7	7	7		28	62.50
Sikha Adarsa							4	4	5.5	7	7	27.5	7	7	7	7	7	35	62.50
Dana							4	4	5.5	7	7	27.5	7	7	7	7	7	35	62.50
Baraha								5	7.5	10	10	32.5	10	10	10			30	62.50
Doba								5	7.5	10	10	32.5	10	10	10			30	62.50
Kuinemangale									5	7.5	10	22.5	10	10	10	10		40	62.50
Darmija									5	7.5	10	22.5	10	10	10	10		40	62.50
Total	-	8.0	19.0	27.0	38.0	92.0	55.0	71.0	92.0	106.0	103	4270	97.0	75.0	68	48	14	302.0	821.00

Attachment 10 Table 2a-4

Mustang Catchment

Panchayat Plantation Establishment Schedule

Fuelwood/Fodder

Panchayat	Ha. to be planted by year																		Grand Total
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	
Marpha	2.5	3.5	3.5	3.5	4.5	17.5	5	5	5	5	5	25	5	5	5	5		20	62.50
Lete		2.5	4.0	7.0	7	20.5	7	7	7	7	7	35	7					7	62.50
Tukuche			2.5	3.5	3.5	9.5	5	5	5	5	5	25	5	5	6	6	6	28	62.50
Kunje			2.5	4	7	13.5	7	7	7	7	7	35	7	7				14	62.50
Jomosom				2.5	4	6.5	5	5	5	5	6	26	6	6	6	6	6	30	62.50
Kowang					2.5	2.5	3.5	5	5	5	6	24.5	6	6	6	6	6	30	57.00
Kagbeni							1.5	2.5	3.5	5.0	5.0	18.5	5	6	6	6	6	29	47.50
Jharkot								2.5	2.5	3.5	5.0	13.5	5	6				11	24.50
Chhusang									2.5	2.5	3.5	8.5	5	5	5	6	6	27	35.50
Fodder Total	2.5	6.0	12.5	20.0	28.5	70.0	35.0	39.0	42.5	45.0	49.5	211	51.0	46.0	34.0	35.0	30.0	196	477.00
Muktinath 1/				2.5	4.5	7.0													7.00
Fuelwood Total	2.5	6.0	12.5	23.0	33.0	77.0	35.0	39.0	42.5	45.0	49.5	211	51.0	46.0	34.0	35.0	30.0	196	484.0

NB 1/ Only Fuel Plantation in Muktinath Panchayat

KULEKHANI CATCHMENT

Weeding Schedule

Panchayat Forest in hectare

Fuelwood/Fodder

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
A. Fuelwood																			
Chitlang	12	32	40	44	48	176	49	25				74							250
Kulekhani		12	32	40	44	128	48	49	25			122							250
Pilung			12	27	31	70	16					16							86
Daman			12	32	40	84	44	48	49	25		166							250
Thahachok				12	32	44	40	44	48	49	25	206							250
Sisneri					12	12	32	40	44	48	49	213	25					25	250
Phakhel							12	32	40	44	48	176	49	25				74	250
Total	12	44	96	155	207	514	241	238	206	166	122	973	74	25				99	1586

B. Fodder - Same as above table

Attachment 10 Table 2b-2

Daraundi Catchment

Weeding Schedule in Ha.

Panchayat Forest

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	G Total
A. Fuelwood																			
Chopral	8	22	28	28	28	114	28	29	31	32	16	136							250
Nareswara		8	22	28	28	86	28	28	29	31	32	148	16					16	250
Kamiswara		8	22	28	14	72													72
Barpak			8	22	28	58	28	28	28	29	31	144	32	16				48	250
Muchok			8	22	28	58	28	28	28	29	31	144	32	16				48	250
Jaubari			8	22	28	58	28	28	28	29	31	144	32	16				48	250
Deorali				8	22	30	28	14				42							72
Taranagar																			
Gorkha Fal				8	20	29	6	28	14			68							96
Taklung				8	22	30	28	28	28	28	29	141	31	32	16			79	250
Khanchok					8		22	28	28	28	28	134	29	31	32	16		108	250
Pandrung					8	8	22	28	28	28	28	134	29	31	32	16		108	250
Tako					8	8	22	28	28	28	28	134	29	31	32	16		108	250
Taple					8	8	22	28	28	28	28	134	29	31	32	16		108	250
Harwi							8	22	28	28	28	114	28	28	30	32	16	134	248
Palungtar							8	20	25	27	28	108	14					14	122
Appipal							8	24	32	32	16	112							
Swara								10	25	35	40	110	40	40	40	20		140	250
Simjung								10	25	35	40	110	40	40	40	20		140	250
Srinath Kot								10	25	35	40	110	40	40	40	20		140	250
Saurpani								10	25	35	40	110	40	40	25	5		110	220
Dungkot									10	25	35	70	40	40	40	40	20	180	250
Bhogtani									10	25	35	70	40	40	40	29	9	158	228
Ghalrung									10	25	35	70	40	40	40	40	20	180	250
Manakamana									10	25	35	70	40	40	40	40	20	180	250
Dhuwakot										10	25	35	35	41	21			97	132
Mirkot										10	25	35	35	40	40	29	9	153	188
Gulkhur										10	25	35	35	40	33	13		121	156
Khoplang										10	25	35	28	13				41	76
TOTAL	8	38	96	174	250	566	334	429	523	657	754	2697	754	686	573	352	94	2459	5722

B. Fodder - Same as above table

Attachment 10 Table 2b-3

MYAGDI CATCHMENT

Weeding Schedule

Panchayat Forest in Ha.

(Fuelwood/Fodder)

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Pakhapani		8	19	22	22	71	25	28	28	28	28	137	28	14				42	250
Beg Khola		8	19	22	22	71	25	28	28	28	28	137	28	14				42	250
Ghatang			8	16	19	43	25	28	28	28	28	137	28	28	14			70	250
Piple			8	16	19	43	25	28	28	30	16	127							170
Jhee				8	16	24	19	25	28	28	28	128	14					14	166
Bhagwati				8	16	24	19	25	28	28	28	128	30	16				46	198
Ramche					8	8	16	19	25	28	28	116	28	28	28	28	14	126	250
Histhan Mandali					8	8	16	19	25	28	28	116	28	28	28	28	14	126	250
Sikha Adarsa							8	16	19	25	28	96	28	28	28	28	28	140	236
Dana							8	16	19	25	28	96	28	28	28	28	28	140	236
Baraha								10	25	35	40	110	40	40	40	20		140	250
Doba								10	25	35	40	110	40	40	40	20		140	250
Kuine Mangale									10	25	35	70	40	40	40	40	20	180	250
Darmija									10	25	35	70	40	40	40	40	20	180	250
TOTAL		16	54	92	130	292	186	252	326	396	418	1578	400	344	286	232	124	1386	3256

Attachment 10 Table 2b-4

Mustang Catchment

Weeding Schedule In Ha.

Panchayat Forests

Fuelwood - Fodder

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
A. Fuelwood																			
Marpha	5	12	14	14	16	61	19	20	20	20	20	99	20	20	20	20	10	90	250
Lete		5	13	22	28	68	28	28	28	28	28	140	28	14				42	250
Tukuche			5	12	14	31	17	20	20	20	20	97	20	20	22	24	24	110	238
Kunje			5	13	22	40	28	28	28	28	28	140	28	28	14			70	250
Jomsom				5	13	18	18	20	20	20	22	100	24	24	24	24	24	120	248
Muktinath				5	14	19	9					9							28
Kowang					5	5	22	17	20	20	22	91	24	24	24	24	24	120	216
Kagbeni							5	10	12	17	20	64	20	22	24	24	24	114	178
Jharkot								5	10	12	17	44	20	22	12			54	98
Chhusang									5	10	12	27	17	20	20	22	24	103	130
Fuelwood Total	5	17	37	71	112	242	136	148	163	175	189	811	201	194	160	138	130	823	1876
B. Fodder (excluding Maktinath)	5	17	37	66	98	223	127	148	163	175	189	802	201	194	160	138	130	823	1848

NB: There is no fodder plantation in Muktinath Panchayat

KULEKHANI CATCHMENT

Casualty Replacement

Panchayat Forest Plantation - Fuelwood/Fodder - Area in Ha.

Attachment 10 Table 2c-1

Panchayat	1	2	3	4	5	Total	6	7	8	9	10	Total	11	12	13	14	15	Total	Grand Total
Chitland		6	10	10	12	38	12	12.5				24.5							62.5
Kulekhani			6	10	10	26	12	12	12.5			36.5							62.5
Palung				6	7.5	13.5	8					8							21.5
Daman				6	10	16	10	12	12	12.5		46.5							62.5
Thahachok					6	6	10	10	12	12	12.5	46.5							62.5
Sisneri							6	10	10	12	12	50.0	12.5					12.5	62.5
Phakhel								6	10	10	12	38.0	12	12.5				24.5	62.5
TOTAL		6	16	32	45.5	99.5	58	62.5	56.5	46.5	36.5	260.0	24.5	12.5				37.0	396.5

Daraundi Catchment
Casualty Replacement
Panchayat Forest Plantation
Fuelwood/Fodder

Attachment 10 Table 2c-2

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Chhoprak		4	7	7	7	25	7	7	7.5	8	8	37.5							62.5
Nareswar			4	7	7	18	7	7	7	7.5	8	36.5	8					8	62.5
Ranlswara			4	7	7	18													18.0
Barpok				4	7	11	7	7	7	7	7.5	35.5	8	8				16	62.5
Muchok				4	7	11	7	7	7	7	7.5	35.5	8	8				16	62.5
Jaubari				4	7	11	7	7	7	7	7.5	35.5	8	8				16	62.5
Deorali					4	4	7	7				14.0							18.0
Taranagar																			
Gorakh Kali					4	4	6	7	7			20.0							24.0
Taklung					4	4	7	7	7	7	7	35.0	7.5	8	8			23.5	62.5
Khanchok							6	7	7	7	7	32.0	7	7.5	8	8		30.5	62.5
Pandrung							4	7	7	7	7	32.0	7	7.5	8	8		30.5	62.5
Tako							4	7	7	7	7	32.0	7	7.5	8	8		30.5	62.5
Taple							4	7	7	7	7	32.0	7	7.5	8	8		30.5	62.5
Harmi								4	7	7	7	25.0	7	7	7	8	8	37.0	62.0
Appipal								4	8	8	8	28.0							28.0
Palungtar								4	6	7.5	7	25.5	7					7.0	30.5
Swara									5	7.5	10	22.5	10	10	10	10		40.0	62.5
Simjung									5	7.5	10	22.5	10	10	10	10		40.0	62.5
Srinath Kot									5	7.5	10	22.5	10	10	10	10		40.0	62.5
Saurpani									5	7.5	10	22.5	10	10	10	2.5		32.5	55.0
Bungkot										5.0	7.5	12.5	10	10	10	10	10	50.0	62.5
Bhogteni										5.0	7.5	12.5	10	10	10	10	4.5	44.5	57.0
Chairung										5.0	7.5	12.5	10	10	10	10	10	50.0	62.5
Mankamana										5.0	7.5	12.5	10	10	10	10	10	50.0	62.5
Dhuwakot											5	5	7.5	10	10.5			28.0	33.0
Mirkot											5	5	7.5	10	10	10	4.5	42.0	47.0
Gaikhur											5	5	7.5	10	10	6.5		34.0	39.0
Khoplang											5	5	7.5	6.5				14.0	19.0
TOTAL		4	15	33	54	106	71	96	118.5	141.0	185.5	614.0	191.5	185.5	157.5	129.0	47.0	710.5	1430.5

MYAGDI CATCHMENT

Casualty Replacement

Panchayat Forest Plantation

(Fuelwood/Fodder)

Attachment 10 Table 2c-3

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Pakhapani			4	5.5	5.5	15	5.5	7	7	7	7	33.5	7	7				14	62.5
Beg Khola			4	5.5	5.5	15	5.5	7	7	7	7	33.5	7	7				14	62.5
Ghatang				4	4	8	5.5	7	7	7	7	33.5	7	7	7			21	62.5
Piple				4	4	8	5.5	7	7	7	8	34.5							42.5
Jhee					4	4	4	5.5	7	7	7	30.5	7					7	41.5
Bhagwati					4	4	4	5.5	7	7	7	30.5	7	8				15	49.5
Ramche							4	4	5.5	7	7	27.5	7	7	7	7	7	35	62.5
Histhan Mandali							4	4	5.5	7	7	27.5	7	7	7	7	7	35	62.5
Sikha Adarsa								4	4	5.5	7	20.5	7	7	7	7	7	35	55.5
Dana								4	4	5.5	7	20.5	7	7	7	7	7	35	55.5
Baraha									5	7.5	10	22.5	10	10	10	10		40	62.50
Doba									5	7.5	10	22.5	10	10	10	10		40	62.5
Kuine Mangale										5	7.5	12.5	10	10	10	10	10	50	62.5
Darmija										5	7.5	12.5	10	10	10	10	10	50	62.5
			8	19	27	54	38	55	71	92	106	362	103	97	75	68	48	391	807.0

Note: Casualty replacement in fodder plot will also be the same.

Attachment 10 Table 2c-4

MUSTANG CATCHMENT

Casualty Replacement

Panchayat Forest

(Fuelwood/Fodder)

Panchayat	1	2	3	4	5	Total	6	7	8	9	10	Total	11	12	13	14	15	Total	Grand Total
Marpha		2.5	3.5	3.5	3.5	13	4.5	5	5	5	5	24.5	5	5	5	5	5	25	62.5
Lete			2.5	4	7	13.5	7	7	7	7	7	35	7	7				14	62.5
Tukuche				2.5	3.5	6.0	3.5	5	5	5	5	23.5	5	5	5	6	6	27	56.5
Kunje				2.5	4	6.5	7	7	7	7	7	35	7	7	7			21	62.5
Jomsom					2.5	2.5	4	5	5	5	5	24	6	6	6	6	6	30	56.5
Muktinath					2.5	2.5	4.5					4.5							7.0
Kowang							2.5	3.5	5	5	5	21.0	6	6	6	6	6	30	51.0
Kagbeni								2.5	2.5	3.5	5	13.5	5	5	6	6	6	28	41.5
Jharkot									2.5	2.5	3.5	8.5	5	5	6			16	24.5
Chhusang										2.5	2.5	5	3.5	5	5	5	6	24.5	29.5
Fuelwood Total		2.5	6	12.5	23	44	33	35	39	42.5	45	194.5	49.5	51	46	34	35	215.5	454.0
Fodder Total (excluding Muktinath)		2.5	6	12.5	20.5	41.5	28.5	35	39	42.5	45	190.0	49.5	51	46	34	35	215.5	447.0

NB: No Fodder Plantation In Muktinath Panchayat

Attachment 10 Table 2d-1

KULEKHANI CATCHMENT

Thinning in Panchayat Forest (Fuelwood Plantation) in Ha.

Panchayat	Yr 8 ITh	Yr 9 ITh	10 Yr ITh	Total	Yr 11 ITh	Yr 12 ITh	Yr 13 ITh	14Yr ITh	14Yr IITh	15Yr ITh	15Yr IITh	Total ITh	Total IITh	Grand Total ITh	Grand Total IITh
Chitlang	6	10	10	26	12	12	12.5		6		10	36.5	16	62.5	16
Kulekhani		6	10	16	10	12	12	12.5			6	46.5	6	62.5	6
Palung			6	6	7.5	8						15.5		21.5	
Daman			6	6	10	10	12	12		12.5		56.5		62.5	
Thehechok					6	10	10	12		12		50.0		50.0	
Sisneri						6	10	10		12		38.0		38.0	
Phakehl							6	10		10		26.0		26.0	
Total	6	16	32	54	45.5	58	62.5	56.5	6	46.5	16	269.0	22	373.0	22

Attachment 10 Table 2d-2

Baraundi Catchment

Thinning in Panchayat Forest (Fuelwood Plant[n])

(Ha)

Panchayat	8 Yr	9 Yr	10 Yr	Total	11 Yr	12 Yr	13 Yr	14th Year		15th Year		Total		Grand Total	
	I	I	I	I	I	I	I	I	II	I	II	I	II	I	II
Chhoprak	4	7	7	18	7	7	7	7.5	4	8	7	36.5	11	54.5	11
Nareswar		4	7	11	7	7	7	7		1.5	4	35.5	4	46.5	4
Kameswara		4	7	11	7						4	7	4	18.0	4
Barpok							4	7		7		18.0		18.0	
Muchok			4	4	7	7	7	7		7		35.0		39.0	
Jaubari			4	4	7	7	7	7		7		35.0		39.0	
Deorali					4	7	7					18.0		18.0	
Taramagar															
Gorakh Kali					4	6	7	7				24.0		24.0	
Taklung						7	7	7		7		32.0		32.0	
Khamchok						4	7	7		7		25.0		25.0	
Pandrung						4	7	7		7		25.0		25.0	
Tako						4	7	7		7		25.0		25.0	
Taple						4	7	7		7		25.0		25.0	
Barni							4	7		7		18.0		18.0	
Appipal							4	8		8		20.0		20.0	
Palungtar							4	6		6.5		16.5		16.5	
Suarra								5		7.5		12.5		12.5	
Simjung															
Srinath Kot								5		7.5		12.5		12.5	
Saurpani								5		7.5		12.5		12.5	
Bungkot										5		5.0		5.0	
Bhogteni										5		5.0		5.0	
Ghairung										5		5.0		5.0	
Manakamana										5		5.0		5.0	
Total	4	15	29	48	47	64	93	113.5	4	135.5	15	453.0	19	501.0	19

MYAGDI CATCHMENT

Thinning in Panchayat Forest

(Fuelwood)

Attachment 10 Table 2d-3

Panchayat	9th Yr. I Th	10th Yr I Th	Total I Th	11th Yr I Th	12th Yr I Th	13th Yr I Th	14th Yr I Th	15th Yr I Th	15th Yr II Th	Total I Th	Total II Th	Grand Total I Th	Grand Total II Th
Pakhapani	4	5.5	9.5	5.5	5.5	7	7	7	4	32.0	4	41.5	4
Beg Khola	4	5.5	9.5	5.5	5.5	7	7	7	4	32.0	4	41.5	4
Ghatang		4.0	4.0	4.0	5.5	7	7	7		30.5		34.5	
Piple		4.0	4.0	4.0	5.5	7	7	7		30.5		34.5	
Jhee				4.0	4.0	5.5	7	7		27.5		27.5	
Bhagawati				4.0	4.0	5.5	7	7		27.5		27.5	
Ramche					4.0	4.0	5.5	7		20.5		20.5	
Histhan Mandali					4.0	4.0	5.5	7		20.5		20.5	
Sikha Adarsa						4.0	4.0	5.5		13.5		13.5	
	8	19.0	27.0	27.0	38.0	51.0	57.0	61.5	8	234.5	8.0	261.5	8.0

MUSTANG CATCHMENT

Thinning in Panchayat Forest (Fuelwood Flat[n])

(1st Thinning)

Panchayat	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total
Marpha	2.5	3.5	3.5	3.5	4.5	[illegible].5
Lete		2.5	4.0	7.0	7.0	20.5
Tukuche			2.5	3.5	3.5	9.5
Kunje			2.5	4.0	7.0	13.5
Jomsom				[illegible].5	4.0	6.5
Muktinath				2.5	4.5	7.0
Kowang					2.5	2.5
	2.5	6.0	12.5	23.0	33.0	77.0

KULEKHANI CATCHMENT

Panchayat Protected Forest Establishment

	Ha. to be established					
Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Chitlang	250					250
Kulekhani	250					250
Palung		250				250
Daman		250				250
Thehechok			250			250
Sisneri				250		250
Phakhel					250	250
Total	500	500	250	250	250	1750

DARAUNDI CATCHMENT

Panchayat Protected Forest Establishment

Panchayat	Ha to be established												Total
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	
Chhoprak	250					250							250
Nareswar	238					238							238
Raneswara	250					250							250
Barpak		250				250							250
Muchok		177				177							177
Jaubari		250				250							250
Deorali			250			250							250
Taranagar			250			250							250
Gorakh Kali			250			250							250
Taklung			250			250							250
Khanchok				250		250							250
Pandrung				250		250							250
Tako				250		250							250
Taple				250		250							250
Harmi					250	250							250
Appipal					250	250							250
Palungtar					250	250							250
Swara							250					250	250
Simjung							250					250	250
Srinath Kot							250					250	250
Saurpani							250					250	250
Bungkot								250				250	250
Bhogteni								250				250	250
Chairung								250				250	250
Manakamana								250				250	250
Dhuwakot									250			250	250
Mirkot									250			250	250
Gaikhur									250			250	250
Khoplang									250			250	250
Total	738	677	1000	1000	750	4165	1000	1000	1000			3000	7165

MYAGDI CATCHMENT

Panchayat Protected Forest Establishment Schedule

Panchayat	Ha. to be established									Grand Total
	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Year 6	Year 7	Total	
Pakhapani	250					250				250
Beg Khola	250					250				250
Chotang		143				143				143
Piple		250				250				250
Jhee			222			222				222
Bhagwati			40			40				40
Ramche				250		250				250
Histhan Mandali				250		250				250
Sikha Adarsa					250	250				250
Dana					250	250				250
Baraha							250		250	250
Doba							250		250	250
Kuine Mangale								250	250	250
Darmija								250	250	250
Total	500	393	262	500	500	2155	500	500	1000	3155

MUSTANG CATCHMENT

Panchayat Protected Forest Establishment

Panchayat	Ha to be established and protected												Grand Total
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	
Marpha	250												250
Tukucha		250											250
Jomsom			250										250
Kagbani				193									193
Lete					250								250
Kunje							250						250
Lowang								250					250
Chhusang									250				250
	250	250	250	193	250	1193	250	250	250			750	1943

Attachment 10 Table 4-1

KULEKHANI CATCHMENT

Community Planting

No. of Seedlings in '000

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	Grand Total
6.6	26.9	50.0	69.3	87.4	240.2	76.5	68.3	60.1	54.6	49.1	308.6	46.4	46.4	46.4	46.4	46.4	232.0	780.8

Attachment 10 Table 4-2

DARAUNDI CATCHMENT

Community Planting

No. of Seedlings in '000

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	Grand Total
11.4	38.6	63.2	94.5	122.8	330.5	131.0	136.4	141.9	150.1	155.6	715.0	158.3	158.3	158.3	158.3	158.3	791.5	1837.0

Attachment 10 Table 4-3

MYAGDI CATCHMENT

Community Planting

No. of Seedlings in '000

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	Grand Total
0.0	11.8	25.0	35.7	49.1	121.6	49.1	51.9	54.6	51.9	51.9	259.4	49.2	49.2	49.2	49.2	49.2	246.0	627.0

Attachment 10 Table 4-4

MUSTANG CATCHMENT

Community Planting

No. of Seedlings in '000

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Total	Grand Total
2.0	6.7	8.8	10.5	13.7	41.7	16.4	16.4	16.4	16.4	16.4	82.0	19.1	19.1	19.1	19.1	19.1	95.5	219.2

KULEKHANI CATCHMENT

Species and Prominence Trail Plots

Attachment 10 Table 5-1
Plot size - 0.2 Ha.

Year	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
No. of Plots	-	10	15	20	20	65	10	10	10	10	10	50	10	10	10	10	10	50	165

DARAUNDI CATCHMENT

Species and Prominence Trail Plots

Attachment 10 Table 5-2
Plot size - 0.2 Ha.

Year	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
No. of Plots	-	10	15	20	20	65	15	15	15	15	15	75	15	15	15	15	15	75	215

MYAGDI CATCHMENT

Species and Prominence Trial Plots

Attachment 10 Table 5-3

Plot size - 0.2 Ha.

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
No. of Plots		10	15	20	20	65	12	12	12	12	12	60	12	12	12	12	12	60	185

MUSTANG CATCHMENT

Species and Prominence Trail Plots

Attachment 10 Table 5-4

Plot size - 0.2 Ha.

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
No. of Plots		10	15	20	20	65	12	12	12	12	12	60	12	12	12	12	12	60	185

Attachment 10 Table 6-1

National Forest	- 8621
Panchayat Protected Forest	- 1750
National Forest Plantn.	- 430
Panchayat Plant^{n} (Fuelwood)	- 396.5
Panchayat Plant^{n} (Fodder)	- -
TOTAL	11594 ha.

KULEKHANI CATCHMENT

Demarcation Program

Length in Km.

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
60	75	85	85	100	405	125	125	125	125	125	625							1030
	60	75	85	85	305	100	125	125	125	125	600							905
60	135	160	170	185	710	225	250	250	250	250	1225							1935

Attachment 10 Table 6-2

DARAUNDI CATCHMENT

Demarcation Program

Length in Km.

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
60	75	85	85	100	405	125	125	125	125	125	625	150	150	150	150	150	750	1780
	60	75	85	85	305	125	125	125	125	125	625	150	150	150	150	150	750	1680
		60	75	85	220	125	125	125	125	125	625	150	150	150	150	150	750	1595
			60	75	135	125	125	125	125	125	625	150	150	150	150	150	750	1510
60	135	220	305	345	1065	500	500	500	500	500	2500	600	600	600	600	600	3000	6265

Total area to be demarcated in Ha = 39411

National Forest = 25670 ha
Panchayat Forest = 7165 ha
National Forest Plot = 3715 ha
Panchayat Forest Plot = 1430.5 ha
" " (Fuelwood) =
" " (Fodder) = 1430.5 ha

Attachment 10 Table 6-3

MYAGDI CATCHMENT

Demarcation Program

Length in Km.

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
60	75	85	85	100	405	100	100	100	125	125	550	125	125	125	150	150	675	1630
	60	75	85	85	305	100	100	100	125	125	550	125	125	125	150	150	675	1530
		60	75	85	220	100	100	100	125	125	550	125	125	125	150	150	675	1445
			60	75	135	100	100	100	125	125	550	125	125	125	150	150	675	1360
60	135	220	305	345	1065	400	400	400	500	500	2200	500	500	500	600	600	2700	5965

Total area to be demarcated in Ha.

National Forest	26895
Panchayat P. Forest	3155
National F. Plantation	4080
Panchayat Forest Plant. (Fuelwood)	821
Panchayat Forest Plant. (Fodder)	821
TOTAL	35772

Attachment 10 Table 6-4

MUSTANG CATCHMENT

Demarcation Program

Length in Km.

1	2	3	4	5	Total	6	7	8	9	10	Total	11	12	13	14	15	Total	Grand Total
60	75	100	100	125	460	125	150	150	150	150	725	150	150	150	150	150	750	1935

Total area to be demarcated in Ha. = 11704

National Forest	6420
Panchayat Protected Forest	1943
National Forest Plantation	2380
Panchayat Forest Plat^{n} (Fuelwood)	484
Panchayat Forest Plat^{n} (Fodder)	477

KULEKHANI CATCHMENT

National Plantation Target (Ha.)

Panchayat	1st	2nd	3rd	4th	5th	Total	6th	7th	8th	9th	10th	Total	11th	12th	13th	14th	15th	Total	Grand Total
Chitlang		25	50	75	75	225	75					75							300) One group only
Kulekhani								40	50			90							90)
Thahachok										40		40							40)
Total		25	50	75	75	225	75	40	50	40		205							430

Attachment 10 Table 7a-2

DARAUNDI CATCHMENT

National Plantation Target

(Ha)

Name of the Pahchayat	1st	2nd	3rd	4th	5th	Total	6th	7th	8th	9th	10th	Total	11th	12th	13th	14th	15th	Total	Grand Total	Remarks
Simjung		20	40	60	80	200	80	80	80	80	80	400	80	80	80	80	80	400	1000) 1000)	Group I
Chhoprak		20	40	60		120													120)	
Srinath Kot				25	60	85													85)	Group II
Jaubari					20	20	60	60	80	80	80	360	40					40	420)	
Muchok													20	60	60	80	80	300	300) 925)	
Manakamana		20	40	60	60	180													180)	
Ghairung					20	20													20)	
Bungkot							40	80				120							120)	Group III
Taple									40			40							40)	
Khanchok									20	60	60	140	60					60	200)	
Pandrung													20	80	80	80	80	340	340) 900)	
Tako		20	40	60	80	200													200)	Group IV
Swara							40	60	80	80	50	310							310)	
Barpak											20	20	60	60	80	80	80	360	380) 890	
Total		80	160	265	320	825	220	280	300	300	290	1390	280	280	300	320	320	1500		

Total area 3715 Ha.

Attachment 10 Table 7a-3

MYAGDI CATCHMENT

National Plantation Target (Ha.)

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total	
Ranche		25	50	80	80	235	80	80	80	80	60	380							615	I
Histhan Mandalli											25	25	80	80	80	80	80	400	425	
Sikha Adarsa		25	50	80	80	235	80	80	80	60		300							535	II
Baraha										25	80	105	80	80	80	80	80	400	505	
Dana		25	50	80	80	235	80	80	80	80	80	400	80	80	80	80	80	400	1035	III
Begkhola		25	50	80	60	215													215	
Doba					25	25	60	70	40			170							195	
Pakhapani									30	60		90							90	IV
Kulne Mangale										25	70	95	80	80	40			200	195	
Darmija															20	50	50	120	120	
		100	200	320	325	945	300	310	310	330	315	1565	320	320	300	290	290	1520	4030	

Attachment 10 Table 7a-4

MUSTANG CATCHMENT

National Plantation Target

(Area in Ha.)

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Kunje		20	40	80	80	220	80	80	80			240							460
Lete									20	60	60	140	60					60	200
Kowang													20	60	80	60		220	220
Tukache																20	80	100	100 = 980
Harpha			20	40	80	140	80	80	80	80	80	400	80					80	620
Jomsom													20	60	60	80	80	300	300 = 920
Kagbeni													20	40	60	60	60	240	240
Chhusang													20	40	60	60	60	240	240 = 480
Total		20	60	120	160	360	160	160	160	160	140	780	220	200	260	280	280	1240	2380

Attachment 10 Table 7b-1

KULEKHANI CATCHMENT

Weeding Schedule

National Plantation In Ha.

Panchayat	1st	2nd	3rd	4th	5th	Total	6th	7th	8th	9th	10th	Total	11th	12th	13th	14th	15th	Total	Grand Total
Chitlang		50	150	250	350	750	300	150				450							1200
Kulekhani								80	180	100		360							360
Thahachok										80	80	160							160
TOTAL		50	150	250	350	750	300	230	180	180	80	970							1720

Attachment 10 Table 7b-2

DARAUNDI CATCHMENT

Weeding Schedule in Ha.

National Plantation

Panchayat	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y10	Total	Y11	Y12	Y13	Y14	Y15	Total	Grand Total
Simjung		40	120	200	280	640	320	320	320	320	320	1600	320	320	320	320	320	1600	3840
Chhoprak		40	120	200	120	480													480
Srinath Kot				50	170	220	120					120							340
Jaubari					40	40	160	240	280	320	320	1320	240	80				320	1680
Muchok													40	160	240	280	320	1040	1040
Manakamana		40	120	200	240	600	120					120							720
Chairung					40	40	40					40							80
Bungkot							80	240	160			480							480
Taple									80	80		160							160
Khanchok									40	160	240	440	240	120				360	800
Pandrung													40	200	320	320	320	1200	1200
Tako		40	120	200	280	640	160					160							800
Swara							80	200	280	320	260	1140	100					100	1240
Barpak											40	40	160	240	280	320	320	1320	1360
Total		60	480	850	1170	2660	1080	1000	1160	1200	1180	5620	1140	1120	1160	1240	1280	5940	14220

Attachment 10 Table 7b-3

MYAGDI CATCHMENT

Weeding Schedule

National Plantation in Ha.

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Ramche		50	150	260	320	780	320	320	320	320	280	1560	120					120	2460
Histhan Mandali											50	50	210	320	320	320	320	1490	1540
Sikha Adarsa		50	150	260	320	780	320	320	320	260	120	1360							2140
Baraha										50	210	260	320	320	320	320	320	1600	1860
Dana		50	150	260	320	780	320	320	320	320	320	1600	320	320	320	320	320	1600	3980
Beg Khola		50	150	260	280	740	120					120							860
Doba					50	50	170	260	220	80		730							780
Pakhapani									60	180	120	360							360
Kulne Mangale										50	190	240	300	320	240	80		940	1180
Darmija															40	140	200	380	380
TOTAL		200	600	1040	1290	3130	1250	1220	1240	1280	1290	6280	1270	1280	1240	1180	1160	6130	15540

Attachment 10 Table 7b-4

MUSTANG CATCHMENT

Weeding Schedule in Ha.

National Plantation

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Kunje		40	120	240	320	720	320	320	320	160		1120							1840
Lete									40	160	240	440	240	120				360	800
Kowang													40	160	280	280	120	880	880
Tukuche																40	200	240	240
Marpha			40	120	240	400	320	320	320	320	320	1600	320	160				480	2480
Jomsom													40	160	240	280	320	1040	1040
Kagbeni													40	120	200	240	240	840	840
Chhusang													40	120	200	240	240	840	840
Total		40	160	360	560	1120	640	640	680	640	560	3160	720	840	920	1080	1120	4680	8960

Attachment 10 Table 7c-1

KULEKHANI CATCHMENT

Casualty Replacement in National Plantation

in Ha.

Panchayat	1st	2nd	3rd	4th	5th	Total	6th	7th	8th	9th	10th	Total	11th	12th	13th	14th	15th	Total	Grand Total
Chitlang			25	50	75	150	75	75				150							300
Kulekhani									40	50		90							90
Thahachok											40	40							40
Total			25	50	75	150	75	75	40	50	40	280							430

Attachment 10 Table 7c-2

DARAUNDI CATCHMENT

Casualty Replacement in National Plantation in Ha.

Panchayat	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
Simjung	20	40	60	120	80	80	80	80	80	400	80	80	80	80	80	400	920
Chhoprak	20	40	60	120													120
Sprinath Kot			25	25	60					60							85
Jaubari					20	60	60	80	80	300	80	40				120	420
Muchok												20	60	60	80	220	220
Manskamana	20	40	60	120	60					60							180
Ghalrung					20					20							20
Bungkot						40	80			120							120
Taple								40		40							40
Khanchok								20	60	80	60	60				120	200
Pandrung												20	80	80	80	260	260
Tako	20	40	60	120	80					80							200
Swara						40	60	80	80	260	50					50	310
Barpak											20	60	60	80	80	300	300
Total	80	160	265	505	320	220	280	300	300	1420	290	280	280	300	320	1470	3395

Attachment 10 Table 7c-3

MYAGDI CATCHMENT

Casualty Replacement in National Plantation in Ha.

Panchayat	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Ramche	25	50	80	155	80	80	80	80	80	400	60					60	615
Histhan Mandali											25	80	80	80	80	345	345
Sikha Adarsa	25	50	80	155	80	80	80	80	60	380							535
Baraha									25	25	80	80	80	80	80	400	425
Dana	25	50	80	155	80	80	80	80	80	400	80	60	80	80	80	400	955
Beg Khola	25	50	80	155	60					60							215
Doba					25	60	70	40		195							195
Pakhapani								30	60	90							90
Kuine Mangale									25	25	70	80	80	40		270	295
Darmija														20	50	70	70
Total	100	200	320	620	325	300	310	310	330	1575	315	320	320	300	290	1545	3740

Attachment 10 Table 7c-4

MUSTANG CATCHMENT

Casualty Replacement in National Plantation

in Ha.

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Yr11	Yr12	Yr13	Yr14	Yr15	Total	Grand Total
Kunje			20	40	80	140	80	80	80	80		320							460
Lete										20	60	80	60	60				120	200
Kowang														20	60	80	60	220	220
Tukuche																	20	20	20
Marpha				20	40	60	80	80	80	80	80	400	80	80				160	620
Jomsom														20	60	60	80	220	220
Kagbeni														20	40	60	60	180	180
Chhusang														20	40	60	60	180	180
Total			20	60	120	200						800						1100	2100

Attachment 10 Table 7d-1

KULEKHANI CATCIMENT

Thinning in National Plantation

in Ha.

	9th Yr ITh	10 Yr ITh	Total	11 Yr ITh	12 Yr ITh	13 Yr ITh	14 Yr ITh	15th Yr I Th	15th Yr II Th	Total Ith	Total II Th	Grand Total Ith	Grand Total II Th
Chitlang	25	50	75	75	75	75			25	225	25	300	25
Kulekhani							40	50		90		90	
Total	25	50	75	75	75	75	40	50	25	315	25	390	25

Attachment 10 Table 7d-2

DARAUNDI CATCHMENT

Thinning in National Plantation (in Ha.)

Panchayat	9th Yr Ith	10th Yr Ith	Total	11th Yr Ith	12th Yr Ith	13th Yr Ith	14th Yr Ith	15th Year Ith	15th Year IIth	Total Ith	Total IIth	Grand Total Ith	Grand Total IIth
Simjung					20	40	60	80		200		200	
Chhoprak	20	20	60	60					20	160	20	120	20
Srinath Kot					25	60				85		85	
Jaubari						20	60	60		140		140	
Manakamana	20	40	60	60	60				20	120	20	180	20
Chaitung						20				20		20	
Bungkot							40	80		120		120	
Tako	20	40	60	60	80				20	140	20	200	20
Swara							40	60		100		100	
Total	60	120	180	180	185	140	200	280	60	985	60	1165	60

Attachment 10 Table 7d-3

MYAGDI CATCHMENT

Thinning in National Plantation in Ha.

Panchayat	Yr 9 I Th	Yr 10 I Th	Total I Th	Yr 11 I Th	Yr 12 I Th	Yr 13 I Th	Yr 14 I Th	Yr 15 I Th	Yr 15 II Th	Total I Th	Total II Th	Grand Total I Th	Grand Total II Th
Ramche	25	50	75	80	80	80	80	80	25	400	25	475	25
Sikha Adarsa	25	50	75	80	80	80	80	80	25	400	25	475	25
Dana					25	50	80	80		235		235	
Beg Khola	25	50	75	80	60				25	140	25	215	25
Doba								25		25		25	
Pakhapani								30		30		30	
Total	75	150	225	240	245	210	240	295	75	1230	75	1455	75

Attachment 10 Table 7d-4

MUSTANG CATCHMENT

Thinning in National Plantation in Ha.

(1st Thinning)

Panchayat	12th	13th	14th	15th	Total
Kunje	20	40	80	80	220
Marpha		20	40	80	140
Total	20	60	120	160	360

Attachment 10 Table 8a-1

KULEKHANI CATCHMENT

Preparation of Management Plan of Panchayat Protected Forest - in Ha

Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Year 6	
Chitlang		250				250		
Kulekhani		250				250		
Palung			250			250		
Daman			250			250		
Thahachok				250		250		
Sisneri					250	250		
Phakhel							250	
Total		50	500	250	250	1500	250	= 1750

Preparation of Management Plan of National Forest

Year 2	Total	
8621	8621	8621

Attachment 10 Table 8a-2

DARAUNDI CATCHMENT

Preparation of Management Plan of Panchayat Protected Forests (in Ha.)

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr10	Total	Grand Total
Chhoprak		250				250							250
Nareswara		238				238							238
Ramiswara		250				250							250
Barpak			250			250							250
Muchok			177			177							177
Jaubari			250			250							250
Deorali				250		250							250
Taranagar				250		250							250
Gorakh Kali				250		250							250
Taklung				250		250							250
Khanchok					250	250							250
Pandrung					250	250							250
Tako					250	250							250
Taple					250	250							250
Harmi							250					250	250
Applpal							250					250	250
Palungtar							250					250	250
Swanra								250				250	250
Simjung								250				250	250
Srinath Kot								250				250	250
Saurpani									250			250	250
Bungkot									250			250	250
Bhogteni									250			250	250
Chaitunh									250			250	250
Manakamana										250		250	250
Khuwakot										250		250	250
Mirkot										250		250	250
Gaikhur										250		250	250
Khoplang													
Total		738	677	1000	1000	3415	750	1000	1000	1000		3750	7165

Yr 2 Preparation of Management Plan of National Forestry in ha. = 25670

25670 25670

MYAGDI CATCHMENT

Preparation of Management Plan of Panchayat Protected Forests in Ha.

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Total	Grand Total
Pakhapani			250			250							250
Beg Khola			250			250							250
Ghatan				143		143							143
Piple				250		250							250
Jhee				222		222							222
Bhagawati					40	40							40
Ranche					250	250							250
Histhan Mandali					250	250							250
Sikha Adarsa							250					250	250
Dana							250					250	250
Baraha								250				250	250
Doba								250				250	250
Kuine Mangale									250			250	250
Darmija									250			250	250
Total			500	615	540	1655	500	500	500			1500	3155

Preparation of Management Plan of National Forests in Ha.

26895 26895 26895

MUSTANG CATCHMENT

Preparation of Management Plan of Panchayat Protected Forests in Ha.

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total	Yr 6	Yr 7	Yr 8	Yr 9	Total	Grand Total
Marpha			250			250						250
Tukuche			250			250						250
Jomsom				250		250						250
Kagbeni					193	193						193
Lete							250				250	250
Kunje								250			250	250
Kowang									250		250	250
Chhusang										250	250	250
Total			500	250	193	943	250	250	250	250	1000	1943

Preparation of Management Plan of National Forests

6398 6398 6398

Attachment 10 Table 8b-1

KULEKHANI CATCHMENT

Implementation of Management Plan

A. Panchayat Protected Forest

Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Chitlang			*	*	*	*	*
Kulekhani			*	*	*	*	*
Palung				*	*	*	*
Daman				*	*	*	*
Thahachok					*	*	*
Sisneri						*	*
Phakhel							*
B. National Forest			*	*	*	*	*

Attachment 10 Table 8b-2

DARAUNDI CATCHMENT

Implementation of Management Plan

A. Panchayat Protected Forests

Panchayat	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Chhoprak			*	*	*	*	*	*	*	*
Nareswar			*	*	*	*	*	*	*	*
Ramiswara			*	*	*	*	*	*	*	*
Barpak				*	*	*	*	*	*	*
Muchok				*	*	*	*	*	*	*
Jaubari				*	*	*	*	*	*	*
Deorali					*	*	*	*	*	*
Taranagar					*	*	*	*	*	*
Gorakh Kali					*	*	*	*	*	*
Taklung					*	*	*	*	*	*
Khanchok						*	*	*	*	*
Pandrung						*	*	*	*	*
Tako						*	*	*	*	*
Taple						*	*	*	*	*
Harmi							*	*	*	*
Appipal							*	*	*	*
Palungtar							*	*	*	*
Swara								*	*	*
Simjung								*	*	*
Srinath Kot								*	*	*
Saurpani								*	*	*
Bungkot									*	*
Bhogteni									*	*
Ghalrung									*	*
Manakamana										*
Dhuwakot										*
Mirkot										*
Gaikhur										*
Khoplani										*
B. National Forests			*	*	*	*	*	*	*	*

Attachment 10 Table 8b-3

MYAGDI CATCHMENT

Implementation of Management Plan

A. Panchayat Protected Forest

Panchayat	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9
Pakhapani				*	*	*	*	*	*
Beg Khola				*	*	*	*	*	*
Chatan					*	*	*	*	*
Piple					*	*	*	*	*
Jhee					*	*	*	*	*
Bhagawati						*	*	*	*
Ramche						*	*	*	*
Histhan Mandali						*	*	*	*
Sikha Adarsa							*	*	*
Dana							*	*	*
Baraha								*	*
Doba								*	*
Kuine Mangale									*
Durmija									*
B. National Forest				*	*	*	*	*	*

Attachment 10 Table 8b-4

MUSTANG CATCHMENT

A. Panchayat Protected Forests

Implementation of Management Plan

Panchayat	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10
Marpha				*	*	*	*	*	*	*
Tukache				*	*	*	*	*	*	*
Jomsom					*	*	*	*	*	*
Kagbeni						*	*	*	*	*
Lete							*	*	*	*
Kunje								*	*	*
Kowang									*	*
Chhusang										*
R. National Forests				*	*	*	*	*	*	*

Attachment 11 Table 1-a

CENTRAL NURSERY

Area 0.09 ha.

	Man-days	Kulekhani	Gorkha	Myagdi	Mustang
A. Capital Cost:					
1. Clearing, terracing & soil working	30	300	300	360	540
2. Fencing 1/		2175	2695	3233	3812
3. Signboard		300	375	450	525
4. Tools		3000	3750	4500	5250
5. Water facility		4000	5000	6000	7000
6. Store		75000	93750	112500	131250
		84775	105870	127043	148377
B. Operating Cost:					
1. Labour	1100	11000	11000	13200	19800
2. Polythene Pots		3700	4625	5500	6475
3. Fungicides/Insectisides		300	375	450	525
4. Seed collection and purchase		4000	5000	6000	7000
5. Maintenance of store (5%) from 4th year		3750	4688	5625	6563
6. Repair of fences:					
a) Nails 1/2 kg.) from 4th year		5	6.25	7.50	8.75
b) Labour 1 manday)		10	10	12	18

N.B: 1/ See Panchayat Nursery Cost.

PANCHAYAT NURSERY

Area 0.09 ha.

	Man-days	Kulekhani	Gorkha	Myagdi	Mustang
A. Capital Cost:					
1. Clearing, terracing & soil working	30	300	300	360	540
2. Fencing 1/		2175	2695	3233	3812
3. Signboard		200	250	300	350
4. Tools (hoe, sickles, crowbar, etc.)		3000	3750	4500	5250
5. Water facility		2000	2500	3000	3500
6. Store		42000	52500	63000	73500
		49675	61995	74393	86952
B. Operating Cost (Cost per ha. planted) (Plants/ha. = 2500, nursery loss 30%)					
1. Seed collection	1	10	10	12	18
2. Soil collection 1 manday/1000 pots		32.50	32.50	39	58.50
3. Soil mixing 1 manday/5000 pots		6.50	6.50	7.80	11.70
4. Pot filling 1 manday/200 pots		162.50	162.50	195	292.50
5. Sowing 1 manday/400 pots		81.25	81.25	97.50	146.25
6. Watering 1 manday/500 pots		65	65	78	117
7. Polythene pots 770 pots/kg Rs. 28/kg.		118.25	147.81	177.38	206.94
		476.00	505.56	606.68	850.89
C. Other Operating Cost (annual per nursery)					
1. Pay of nursery foreman		4548	5328	6216	676[illegible]
2. Maintenance of store (5%) from 4th year		2100	2625	3150	367[illegible]
3. Repair of fences:					
a) Nails ½ kg. } from 4th year		5	6.25	7.50	8.7[illegible]
b) Labor 1 manday } from 4th year		10	10	12	18
4. Miscellaneous works	30	300	300	360	54[illegible]

N.B.:

1/ Fencing of 0.09 ha: Perimeter = 127 m.

1. Barbed wire 95 Kg.	950	1188	1425	166[illegible]
2. Nails 4 Kg.	40	50	60	7[illegible]
3. Fencing posts 70 pieces	1050	1313	1575	183[illegible]
4. Coal tar	35	44	53	6[illegible]
5. Labor 10 mandays	100	100	120	18[illegible]
	2175	2695	3233	381[illegible]

PANCHAYAT FOREST ESTABLISHMENT (FUELWOOD) PER HA.

	Kulekhani		Gorkha		Myagdi		Mustang	
	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol
. Capital Cost:								
1. Plants	476		506		607		851	
2. Pitting 35 pits/day	714		714		857		1286	
3. Fencing 1/	350		450		550		650	
4. Signboard	20		25		30		35	
Year 1 Cost --	1560		1695		2044		2822	
5. Seedling transport 150 plants/day	167		167		200		300	
6. Transport basket	10		13		15		18	
7. Planting 75 plants/day		333		333		400		60(
8. Replacement plants	143		152		182		255	
Year 2 Cost --	320	333	332	333	397	400	573	60(
9. Casualty replacement:								
a) Seedling transport 150 plants/day	50		50		60		90	
b) Hoeing and planting 40 plants/day		188		188		226		33(
Year 3 Cost --	50	188	50	188	60	226	90	33(
. Operating Cost:								
1. 2/ Weeding & hoeing 60 plants/day		417		417		500		75(
2. 3/ Watcher 15 mandays	150		150		180		270	
3. 3/ Fire watcher 5 mandays	50		50		60		90	

	Kulekhani	Gorkha	Myagdi	Mustang
N.B.:				
1/ Fencing:				
1. Barbed wire 80 Kg.	800	1000	1200	1400
2. Nails 2 Kg.	20	25	30	35
3. Fencing posts 40 pieces	600	750	900	1050
4. Labour 5 mandays	50	50	60	90
	1470	1825	2190	2575
25% of the above cost (25% of area)	367.50	456.25	547.50	643.75
Say	350	450	550	650

2/ For 2 years only.

3/ a. For 10 years only. From 11th year 3 and 7 mandays for fire protection and watchers respectively.

b. From 11th year of plantation only 50% of the cost will be met by the project.

Attachment 11 Table 2-b

PANCHAYAT FOREST ESTABLISHMENT COST (FODDER) PER HA.

	Kulekhani		Gorkha		Myagdi		Mustang	
	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol
A. Capital Cost:								
1. Plants	155		165		198		278	
2. Pitting 35 pits/day	233		233		280		420	
3. 1/ Fencing	350		450		550		650	
4. Signboard	20		25		30		35	
Year 1 Cost --	758		873		1058		1383	
5. Seedling transport 150 plants/day	54		54		65		97	
6. Transport basket	10		13		15		18	
7. Planting 75 plants/day		109		109		131		196
8. Replacement plants	47		50		59		83	
Year 2 Cost --	111	109	117	109	139	131	198	196
9. Casualty replacement:								
a. Seedling transport 150 plants/day	16		16		19		29	
b. Hoeing & planting 40 plants/day		61		61		73		110
Year 3 Cost --	16	61	16	61	19	73	29	110
B. Operating Cost:								
1. 2/ Weeding & hoeing 60 plants/day		136		136		163		245
2. 3/ Watcher 15 mandays	150		150		180		270	
3. 3/ Fire watcher 5 mandays	50		50		60		90	

1/ For details see Panchayat Forest Establishment Cost (Fuelwood).

2/ For 2 years only.

3/ a. For 10 years only. From 11th year 3 and 7 mandays for fire protection and watchers respectively.
b. From 11th year only 50% of the cost will be met by the project.

FOREST DEMARCATION

Unit cost per Km.

	Kulekhani	Gorkha	Myagdi	Mustang
A. Capital Cost:				
Cost of tools and frames 1/	18000	45000	54000	31500
B. Operating Cost:				
1. Pillar 2/ 20 nos.	582	703	851	1036
2. Transport 20 mandays	200	200	240	360
3. Setting of pillars 10 mandays	100	100	120	180
4. Survey of demarcation 2 mandays	20	20	24	36
5. Reference pillar 1 no.	200	200	200	200
	1102	1223	1435	1812
1/ Tools	3000	7500	9000	5250
Wooden frames	15000	37500	45000	26250
	18000	45000	54000	31500
2/ Construction of pillars				
Cement per pillar 4.17 Kg.	12.51	15.64	18.77	21.89
Iron rods 1.45 Kg.	11.60	14.50	17.40	20.30
Labor skilled 1/5 mandays	3.00	3.00	4.00	5.00
Labor 1/5 mandays	2.00	2.00	2.40	3.60
	29.11	35.14	42.57	51.79

N.B. Local material be used in Myagdi and Mustang area.

Attachment 11 Table 4

TRIAL PLOTS (0.2 HA.)

Unit Cost per plot

	Kulekhani	Gorkha	Myagdi	Mustang
A. Capital Cost:				
1. Plants	48	51	61	85
2. Pitting 35 pits/day	143	143	172	257
3. Fencing 190 m 1/	2820	3495	4194	4941
4. Signboard	200	250	300	350
Year 1 Cost --	3211	3939	4727	5633
5. Seedling transport 150 plants/day	33	33	40	59
6. Transport basket	10	13	15	18
7. Planting 75 plants/day	57	67	80	121
8. Replacement plants	14	15	18	26
Year 2 Cost --	124	128	153	224
9. Casualty replacement.				
a. Seedling transport 150 plants/day	10	10	12	18
b. Hoeing & planting 40 plants/day	38	38	46	68
Year 3 Cost --	48	48	58	86
B. Operating Cost:				
1. 2/ Weeding & hoeing 60 plants/day	83	83	100	149
2. Repair of fences.				
a. Nails ½ Kg.) From 4th year	5	6.25	7.5	8.75
b. Labour 1 manday) From 4th year	10	10	12	18

1/ Fencing:

1. Barbed wire 130 Kg.	1300	1625	1950	2275
2. Nails 5 Kg.	50	62.50	75	87.50
3. Fencing posts 90 pieces	1350	1687.50	2025	2362.50
4. Labor 12 mandays	120	120	144	216
	2820	3495	4194	4941

2/ Two weedings for 2 years only.

Attachment 11 Table 5

NATIONAL PLANTATION ESTABLISHMENT COST

(Per Ha.)

	Kulekhani	Gorkha	Myagdi	Mustang
A. Capital Cost:				
1. Plants	476	506	607	851
2. Pitting 35 pits/day	714	714	857	1286
3. 1/ Fencing	1470	1825	2190	2575
Year 1 Cost --	2660	3045	3654	4712
4. Seedling transport 250 plants/day	100	100	120	180
5. Transport basket	10	13	15	18
6. Planting 75 plants/day	333	333	400	600
7. Replacement plants	143	152	182	255
Year 2 Cost --	586	598	717	1053
8. Casualty replacement:				
a. Seedling transport 250 plants/day	30	30	36	54
b. Hoeing & planting 40 plants/day	188	188	226	338
Year 3 Cost --	218	218	262	392
B. Other Capital Cost:				
1. Tools	3000	26250	36000	21000
C. Operating Cost per ha.				
1. 2/ Weeding & Hoeing 60 plants/day	417	417	500	750
2. Watcher 7 mandays	70	70	84	126
3. 3/ Fire watcher 3 mandays	30	30	36	54
4. 4/ Repair of fences				
a. Nails ½ Kg.	5	6.25	7.50	8.7
b. Labor 1 manday	10	10	12	18
D. Other operating cost (annual):				
1. 5/ Repair and replacement of tools (5%)	150	875	1200	700
2. Signboard	1000	5000	6000	1750
3. Shade construction	400	400	480	720
1/ Fencing				
1. Barbed wire 80 Kg.	800	1000	1200	1400
2. Nails 2 Kg.	20	25	30	35
3. Fencing Posts 40 pieces	600	750	900	1050
4. Labor 5 mandays	50	50	60	90
	1470	1825	2190	2575

2/ For 2 years only.
3/ During the fire season only.
4/ From the 4th year only.
5/ From the 3rd year.

Attachment 11 Table 6

THINNING PER HA.

	Kulekhani	Gorkha	Myagdi	Mustang
First thinning 6 mandays	60	60	72	108
Second Thinning 15 mandays	150	150	180	270
Final harvesting 40 mandays	400	400	480	720

Attachment 11 Table 7

PANCHAYAT PROTECTED FOREST ESTABLISHMENT COST

(Per ha.)

	Kulekhani	Gorkha	Myagdi	Mustang
Operating Cost:				
1. Watcher 7 mandays	70	70	84	126
2. Fire watcher 3 mandays	30	30	36	54
	100	100	120	180

N.B.: The above cost will be borne by the project for 5 years after the initiation of Panchayat Protected Forest.

Attachment 11 Table 8

MANAGEMENT PLAN

1. Preparation of management plan:

   a. National Forest Rs. 20/ha.

   b. Panchayat Protected Forest Rs. 25/ha.

2. Implementation of management plan:

   a. National Forest Rs. 20/ha.

   b. Panchayat Protected Forest Rs. 20/ha.

Kulekhani Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-a

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		739.0	162.0			901.0													901.0
a) Forest Proj. Office (860 sq. ft.)		95.0				95.0													95.0
b) Officers Qrt. B Type with garage (900 x 150 sq. ft.)		115.0				115.0													115.0
c) Staff Qrt. (780 sq. ft.)		78.0				78.0													78.0
d) Range Office		80.0				80.0													80.0
e) Range Quarter		50.0				50.0													50.0
f) Foresters Qrt. (4Nos)		126.0	42.0			168.0													168.0
g) Forest Guard Qrts (8Nos)		120.0	120.0			240.0													240.0
h) Central Nursery Store		75.0				75.0													75.0
2. Purch. of Land for Bldgs. (10 Ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee	10.9	14.8	3.2			28.9													28.9
4. Furniture	13.0	4.0	1.0			18.0													[illegible]
5. Vehicle (4WD Diesel Imp)	200.0					200.0													200.0
2/																			
6. Equipment	20.0	5.0	5.0	11.0	5.0	46.0	5.0	11.0	5.0	5.0	6.0	32.0							78.0
a) Office	10.0			6.0		16.0		6.0			6.0	12.0							28.0
b) Field	10.0	5.0	5.0	5.0	5.0	30.0	5.0	5.0	5.0	5.0		20.0							50.0
3/																			
7. Nursery Establishment	109.2	99.4	49.7	49.7	49.7	357.7													357.7
a) Central Nursery	9.8					9.8													9.8
b) Nursery	99.4	99.4	49.7	49.7	49.7	347.9													347.9
4/																			
8. Panchayet Forest Establishment	30.7	81.4	120.3	156.1	172.8	570.1	161.7	136.2	108.3	75.6	42.0	523.8	7.0	0.8				7.8	801.9
a) Fuel-wood	26.9	55.1	82.0	106.6	118.3	389.1	111.0	93.7	74.6	52.2	29.2	360.7	5.2	0.6				5.8	755.6
b) Fodder	12.8	26.1	38.3	49.5	54.5	181.2	50.7	42.5	33.7	23.4	12.8	163.1	1.8	0.2				2.0	346.3

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 4, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Daraundi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.8	160.2	170.6	191.2	187.3	815.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.8	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	970.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.9	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.8	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Darauadi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.0	160.2	170.6	191.2	187.3	915.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.6	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	570.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.5	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.6	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building			856.5	564.0	369.0	1789.5	360.0					360.0							2149.5
a) Forest Prefect Office (960 Sft.)			142.5			142.5													142.5
b) Officers Quarter B Type (900 Sft.)			148.5			148.5													148.5
b2) Stable			15.0			15.0													15.0
c) Staff Quarter (880 sft)			117.0			117.0													117.0
d) Range Office (2 Nos)			120.0	120.0		240.0													240.0
e) Range Quart. (2 Nos)			75.0	75.0		150.0													150.0
f) Foresters Quarters (2 Nos)			126.0	189.0	189.0	504.0													504.0
g) Forest Guards Quart. (16 Nos)				180.0	180.0	360.0	360.0					360.0							720.0
h) Central Nursery Store			112.5			112.5													112.5
2. Purchase of Land for Building (1) Rapaldi	28.0	12.0	12.0			52.0													52.0
10/																			
3. Design and Supervision Fee			17.1	11.3	7.4	35.8	7.2					7.2							43.0
4. Furniture	19.5	7.5	7.5			34.5													34.5
5. Horse with Saddle	6.0					6.0							6.0					6.0	12.0
2/																			
6. Equipment	39.0	12.0	12.0	21.0	12.0	96.0	12.0	21.0	12.0	12.0	21.0	78.0	12.0	12.0	21.0	12.0		57.0	231.0
a) Office	15.0			9.0		24.0		9.0			9.0	18.0			9.0			9.0	51.0
b) Field	24.0	12.0	12.0	12.0	12.0	72.0	12.0	12.0	12.0	12.0	12.0	60.0	12.0	12.0	12.0	12.0		48.0	180.0
3/																			
7. Nursery Establishment	163.3	148.8	148.8	148.8	148.8	758.5	148.8	148.8				297.6							1056.1
a) Central Nursery	14.5					14.5													14.5
b) Nursery	148.8	148.8	148.8	148.8	148.8	744.0	148.8	148.8				297.6							1041.6
4/																			
8. Panchayat Forest Establishment	24.4	63.2	94.6	133.8	193.1	509.6	252.3	327.8	383.[illegible]	383.6	364.5	1711.9	292.8	258.8	191.3	74.6	11.3	828.8	3050.3
a) Fuel Wood	16.4	42.0	63.2	89.5	129.1	340.2	168.8	219.5	257.4	258.1	245.5	1149.3	198.0	174.6	129.6	51.8	8.4	562.4	2051.9
b) Fodder	8.5	21.2	31.4	44.3	64.0	169.4	83.5	108.3	126.3	125.5	119.0	562.6	94.8	84.2	61.7	22.8	2.9	266.4	998.4

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Table 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11 Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 2, 10/ 5% for design and 2% for construction supervision of buildings.

Myardi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-c (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. Priv. Planting	2.9	6.1	8.7	11.9	11.9	41.5	12.6	13.2	12.6	12.6	11.9	62.9	11.9	11.9	11.9	11.9	11.9	59.5	163.9
6/ 10. Forest Demarcation	9.0					9.0	18.0					18.0	27.0					27.0	34.0
7/ 11. Trial Plots	47.3	72.4	97.4	98.5	61.0	376.6	59.7	59.2	59.2	59.2	59.2	296.5	59.2	59.2	59.2	59.2	2.5	239.3	962.4
8/ 12. National Plantation Establishment	374.4	802.5	1338.9	1469.4	1413.0	5398.2	1446.5	1443.6	1509.3	1468.8	1481.7	7339.9	1481.2	1409.4	1358.6	1346.2	283.9	5879.3	18617.4
9/ 13. Prep. of Management Plan			550.4	15.4	13.5	579.3	12.5	12.5	12.5			37.5							616.8
a) National Forest			537.9			537.9													537.9
b) Panchayat Protected Forest			12.5	15.4	13.5	41.4	12.5	12.5	12.5			37.5							78.9
14. Demonstration Saw Mill with Ins.				288.0		288.0													288.0
15. Charcoal Pilot Project									50.0	50.0		100.0							100.0
Total Capital Cost	714.3	1124.5	3143.9	2762.1	2229.7	9974.5	2329.6	2016.1	2039.3	1986.2	1938.3	10309.5	1890.1	1751.3	1642.0	1503.9	309.6	7096.9	27,380.9

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Table 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-d

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Building			999.4	655.0	430.5	2087.9	420.0					420.0							2507.9
a) Forest Proj. Office (860 Sft.)			166.3			166.3													166.3
b) Officers Quarters B Type (900 Sft.)			173.3			173.3													173.3
			17.5			17.5													17.5
c) Staff Quarter(720Sft)			136.5			136.5													136.5
d) Range Office (2 Nos)			140.0	140.0		280.0													280.0
e) Range Quarter (2 Nos)			87.5	87.5		175.0													175.0
f) Forest Quarter(8 Nos)			147.0	220.5	220.5	588.0													588.0
g) Forest Guards Quart. (16 Nos)				210.0	210.0	420.0	420.0					420.0							840.0
h) Central Nursery Store			131.3			131.3													131.3
2. Purchase of Land for Building(13 Ropanis)	28.0	12.0	12.0			52.0													52.0
10/ 3. Design & Supervision Fee			20.0	13.2	8.6	41.8	8.4					8.4							50.2
4. Furniture	22.8	8.8	8.8			40.4													40.4
5. Horse with Saddle	6.0					6.0							6.0					6.0	12.0
2/ 6. Equipment & Tools	31.5	7.0	7.0	17.5	7.0	70.0	7.0	17.5	7.0	7.0	17.5	56.0	7.0	7.0	17.5	7.0		38.5	164.3
a) Office	17.5			10.5		28.0		10.5			10.5	21.0			10.5			10.5	59.4
b) Field	14.0	7.0	7.0	7.0	7.0	42.0	7.0	7.0	7.0	7.0	7.0	35.0	7.0	7.0	7.0	7.0		28.0	105.0
3/ 7. Nursery Establishment	191.0	173.9	173.9	87.0	87.0	712.8	87.0	87.0				174.0							886.8
a) Central Nursery	17.1					17.1													17.1
b) Nursery	173.9	173.9	173.9	87.0	87.0	695.7	87.0	87.0				174.0							869.7
4/ 8. Panchayat Forest Establishment	27.2	57.4	103.6	151.2	174.3	513.7	194.8	212.9	226.7	247.9	257.9	140.2	238.7	184.5	178.9	157.2	27.3	786.6	2440.5
a) Fuel Wood	18.4	38.9	72.6	107.4	119.7	357.0	133.1	145.4	154.9	169.3	176.3	779.0	163.5	126.9	122.4	107.8	20.3	540.9	1676.9
b) Fodder	8.8	18.5	31.0	43.8	54.6	156.7	61.7	67.5	71.8	78.6	81.6	361.2	75.2	57.6	56.4	49.4	7.0	245.7	763.6
5/ 9. Seedling Distribution for Priv. Planting	2.3	3.6	4.7	5.6	5.6	21.8	5.6	5.6	5.6	5.6	5.6	28.0	6.5	6.5	6.5	6.5	6.5	32.5	82.3

1/ See appendix 8, 2/ See appendix 7, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-d (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
6/ 10. Forest Demarcation	7.9					7.9	11.8					11.8	11.8					11.8	31.5
7/ 11. Trial Plots	56.1	86.7	116.9	118.3	73.6	451.8	71.8	71.2	71.2	72.1	71.2	356.6	71.2	71.2	71.2	71.2	3.6	288.4	1096.8
8/ 12. National Plantation Establishment	97.7	303.8	636.4	903.8	969.4	2911.1	992.1	985.1	985.1	890.9	1246.7	5099.9	239.5	1521.9	671.6	1716.1	404.6	5553.7	14564.7
9/ 13. Prep. of Management Plan			141.3	6.3	4.8	152.4	6.3	6.3	6.3	6.3		25.2							177.6
a) National Forest			128.8			128.8													128.8
b) Panchayat Protected Forest			12.5	6.3	4.8	23.6	6.3	6.3	6.3	6.3		25.2							48.8
14. Demonstration Saw Mill with Instal.					300.0	300.0													300.0
15. Charcoal Pilot Project										50.0	50.0	100.0							100.0
TOTAL CAPITAL COST	470.7	653.2	2224.0	1960.9	2060.8	7369.6	1804.8	1385.6	1301.9	1778.9	1648.9	7420.1	1580.7	1791.1	845.7	1958.0	442.0	7717.5	22507.2

1/ See appendix 8, 2/ See appendix 7, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-a

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	216.1	260.6	264.4	283.2	302.3	1326.6	322.3	362.6	348.6	351.9	355.6	1741.0	145.5	132.9	133.0	133.1	133.3	677.8	3745.4
a) New Staff (Pay & Allowances)	156.8	201.3	205.1	223.9	243.0	1030.1	263.0	303.3	289.3	292.6	297.3	1444.5	86.2	73.6	73.7	73.8	74.0	381.3	2855.9
b) Existing Staff (Allowances only)	59.3	59.3	59.3	59.3	59.3	296.5	59.3	59.3	59.3	59.3	59.3	296.5	59.3	59.3	59.3	59.3	59.3	296.5	889.5
2. Office Supplies	6.0	8.0	8.0	8.0	8.0	38.0	8.0	8.0	8.0	8.0	8.0	40.0	8.0	8.0	8.0	8.0	8.0	40.0	118.0
3. Rent	12.0	12.0				24.0													24.0
2/ 4. Maintenance of Bldgs.					37.0	37.0	45.1	45.1	45.1	45.1	45.1	225.5	45.1	45.1	45.1	45.1	45.1	225.5	488.0
5. Operation & Maint. of Vehicle	30.0	40.0	40.0	40.0	40.0	190.0	50.0	50.0	50.0	50.0	50.0	250.0	60.0	60.0	60.0	60.0	60.0	300.0	740.0
6. Service & Rep. of Equipment		1.0	1.0	1.0	1.0	4.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	14.0
3/ 7. Maint. of Nurseries	28.6	38.4	43.2	52.3	61.4	223.9	63.5	65.6	67.7	67.7	67.7	332.2	67.7	67.7	67.7	67.7	67.7	338.5	894.6
a) Central Nursery	19.0	19.0	19.0	19.0	19.0	95.0	19.0	19.0	19.0	19.0	19.0	95.0	19.0	19.0	19.0	19.0	19.0	95.0	285.0
b) Panchayat Nursery	9.6	19.4	24.2	33.3	42.4	128.9	44.5	46.6	48.7	48.7	48.7	237.2	48.7	48.7	48.7	48.7	48.7	243.5	609.6
4/ 8. Maint. of Panch. Plantation	2.4	8.8	21.6	39.8	63.0	135.6	88.0	110.6	129.2	143.8	153.6	625.2	156.8	152.0	142.4	128.8	111.4	691.4	1452.2
a) Fuel Wood	1.2	4.4	10.8	19.9	31.5	67.8	44.0	55.3	64.6	71.9	76.8	312.6	78.4	76.0	71.2	64.4	55.7	345.7	726.1
b) Fodder	1.2	4.4	10.8	19.9	31.5	67.8	44.0	55.3	64.6	71.9	76.8	312.6	78.4	76.0	71.2	64.4	55.7	345.7	726.1
5/ 9. Forest Demarcation	66.1	148.8	176.3	187.3	203.9	782.4	248.0	275.5	275.5	275.5	275.5	1350.0							2132.4
6/ 10. Maint. of Trial Plots		1.7	4.2	6.0	7.0	18.9	5.7	4.3	4.4	4.6	4.9	23.9	5.0	5.3	5.4	5.5	6.0	27.2	70.0
7/ 11. Maint. of National Plantation	1.4	24.8	71.7	121.3	150.3	369.5	159.0	134.9	120.2	126.3	86.9	627.3	55.0	55.0	55.0	52.9	57.3	275.2	1272.0
a) Temporary Shade	0.4	0.4	0.4	0.4	0.4	2.0	0.4	0.4	0.4	0.4	0.4	2.0							4.0
b) Sign Board	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	15.0
c) Reparation & replacement of Tools			0.2	0.2	0.2	0.6	0.2	0.2	0.2	0.2	0.2	1.0							1.6
d) " " of Fences				0.4	1.1	1.5	2.3	3.4	4.5	5.1	5.9	21.2	6.5	6.5	6.5	6.5	6.5	32.5	55.2
e) Weeding		20.9	62.6	104.3	125.1	312.9	125.1	95.9	75.1	75.1	33.4	404.6							717.5

1/ See appendix 13, Table 7a, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Kulekhani Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
11. Maint. of National Plantation																			
f) Watcher		2.5	7.5	15.0	22.5	47.5	30.0	34.0	35.0	43.0	43.0	189.0	43.0	43.0	43.0	43.0	43.0	215.0	451.5
g) Thinning										1.5	3.0	4.5	4.5	4.5	4.5	2.4	6.8	22.7	27.2
8/ 12. Maint. of Panchayat Protected Forest	50.0	100.0	125.0	150.0	175.0	600.0	125.0	75.0	50.0	25.0		275.0							875.0
9/ 13. Implementation of Management Farm			182.4	192.4	197.4	572.2	202.4	207.4	207.4	207.4	207.4	1032.0	207.4	207.4	207.4	207.4	207.4	1037.0	2641.2
a) National Forest			172.4	172.4	172.4	517.2	177.4	172.4	172.4	172.4	172.4	862.0	172.4	172.4	172.4	172.4	172.4	862.0	2241.2
b) Panchayat Protected Forest			10.0	20.0	25.0	55.0	30.0	35.0	35.0	35.0	35.0	170.0	35.0	35.0	35.0	35.0	35.0	175.0	400.0
14. Demonstration Saw Mill		50.0	75.0	75.0	75.0	275.0	75.0	100.0	100.0	100.0	100.0	475.0	100.0	100.0	100.0	100.0	100.0	500.0	1250.0
15. Publicity & Extension	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0	10.0	50.0	150.0
TOTAL OPERATING COST	422.6	704.1	1022.8	1166.3	1331.3	4647.1	1403.0	1450.0	1417.1	1416.3	1365.7	7052.1	861.5	844.4	835.0	819.5	807.2	4167.6	15866.8

1/ See appendix 11, Table 2a, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Barguadi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ I. Staff	412.9	467.3	523.0	656.3	662.9	2722.4	748.2	755.7	763.3	770.9	778.5	3816.6	868.8	869.5	869.6	869.6	870.4	4348.0	10387.0
a) New Staff (Pay & Allowances)	351.6	406.0	461.7	595.0	601.6	2415.9	686.9	694.4	702.0	709.6	717.2	3510.1	807.5	808.0	808.3	808.6	809.1	4041.5	9967.5
b) Existing Staff (Allowances Only)	61.3	61.3	61.3	61.3	61.3	306.5	61.3	61.3	61.3	61.3	61.3	306.5	61.3	61.3	61.3	61.3	61.3	306.5	919.5
2. Office Supplies	10.0	12.0	12.0	12.0	12.0	58.0	12.0	12.0	12.0	12.0	12.0	60.0	12.0	12.0	12.0	12.0	12.0	60.0	178.0
3. Rent	12.0	12.0				24.0													24.0
2/ 4. Maintenance of Bldg.					46.2	46.2	56.3	56.3	56.3	56.3	56.3	281.5	56.3	56.3	56.3	56.3	56.3	281.5	609.2
5. Operation & Maint. of Vehicle	30.0	40.0	40.0	40.0	40.0	190.0	50.0	50.0	50.0	50.0	50.0	250.0	50.0	50.0	50.0	50.0	50.0	300.0	740.0
6. Service & Repair of Equipments		2.0	2.0	2.0	2.0	8.0	2.0	2.0	2.0	2.0	2.0	10.0	2.0	2.0	2.0	2.0	2.0	10.0	28.0
3/ 7. Maintenance of Nurseries	37.9	54.8	77.3	107.7	132.5	410.2	165.6	193.7	229.1	239.7	250.2	1083.3	260.8	260.8	260.8	260.8	260.8	1304.0	2797.5
a) Central Nursery	21.0	21.0	21.0	21.0	21.0	105.0	21.0	21.0	21.0	21.0	21.0	105.0	21.0	21.0	21.0	21.0	21.0	105.0	315.0
b) Panchayat Nursery	16.9	33.8	56.3	86.7	111.5	305.2	144.6	177.7	208.1	218.7	229.2	978.3	239.8	239.8	239.8	239.8	239.8	1199.0	2482.5
4/ 8. Maint. of Panchayat Plantation	1.6	7.6	16.8	33.4	66.8	131.2	105.2	152.6	209.8	284.0	360.6	1112.2	433.6	492.2	532.8	535.4	514.2	2508.2	3751.6
a) Fuel Wood	0.8	3.8	8.4	19.2	33.4	65.6	52.6	76.3	104.9	142.0	180.3	556.1	216.8	246.1	266.4	267.7	257.1	1254.1	1875.8
b) Fodder	0.8	3.8	8.4	19.2	33.4	65.6	52.6	76.3	104.9	142.0	180.3	556.1	216.8	246.1	266.4	267.7	257.1	1254.1	1875.8
5/ 9. Forest Demarcation	73.4	165.1	269.1	373.0	421.9	1302.5	611.5	611.5	611.5	611.5	611.5	3057.5	733.8	733.8	733.8	733.8	733.8	3669.0	8029.0
6/ 10. Maintenance of Trial Plot		1.7	4.2	5.8	6.6	18.3	5.8	5.0	5.0	5.1	5.2	26.1	5.2	5.2	5.2	5.2	5.5	26.3	70.7
7/ 11. Maint. of National Plantation	5.4	80.1	230.5	412.6	530.6	1259.2	569.4	569.2	669.5	725.5	755.9	3289.5	778.0	806.0	851.2	924.8	991.6	4352.0	8900.7
8/ 12. Maint. of Panchayat Protected Forest	73.0	141.5	241.5	341.5	416.5	1214.0	442.7	475.0	475.0	400.0	300.0	2092.7	200.0	100.0	100.0			400.0	3707.5
9/ 13. Implementation of Mgmt. Plan			528.2	541.7	561.7	1631.6	581.7	596.7	616.7	636.7	656.7	3088.5	656.7	656.7	656.7	656.7	656.7	3283.5	8003.6

1/ See appendix 13, Table 2b, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11 Table 5 & 6, 8/ See appendix 11 Table 7, 9/ See appendix 11, Table 8

Attachment 12 Table 2-b (cont.)

Dargandi Catchment
(Capital Cost)
'000 NRS

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
13. Implementation of Mgmt. Plan																			
a. National Forest			513.4	513.4	513.4	1540.2	513.4	513.4	513.4	513.4	513.4	2567.0	513.4	513.4	513.4	513.4	513.4	2567.0	6674.2
b. Panchayat Forest			14.0	28.1	48.1	91.4	62.1	81.2	103.2	123.3	143.3	521.5	143.3	143.3	143.3	143.3	143.3	716.5	1329.4
14. Demonstration Saw Mill			50.0	75.0	75.0	200.0	75.0	75.0	100.0	100.0	100.0	450.0	100.0	100.0	100.0	100.0	100.0	500.0	1150.0
15. Publicity and Extension	25	25	25	25	25	125	25	25	25	25	25	125	25	25	25	25	25	125	375.0
TOTAL OPERATING COST	682.0	1009.1	2019.6	2631.0	2999.7	9341.4	3450.4	3504.7	3525.2	2918.7	3963.9	18702.9	4192.6	4179.3	4265.4	4241.9	4288.3	21167.5	49251.8

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	523.3	585.7	660.7	815.4	822.2	3407.3	828.2	835.2	842.0	941.6	949.1	4396.6	956.7	957.1	957.5	1052.0	1053.0	4976.9	12780.8
a) New Staff (Pay and Allowances)	411.7	474.1	549.1	703.5	710.6	2849.3	717.1	723.6	730.4	830.0	837.5	3838.6	845.1	845.5	845.9	941.0	941.4	4418.9	11106.8
b) Existing Staff (Allowances only)	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	1674.0
2. Office Supplies	12.0	15.0	15.0	15.0	15.0	72.0	15.0	15.0	15.0	15.0	15.0	75.0	15.0	15.0	15.0	15.0	15.0	75.0	222.0
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldg.							42.8	71.0	89.5	107.5	107.5	418.3	107.5	107.5	107.5	107.5	107.5	537.5	955.8
5. Ration for Horse	2.5	3.6	3.6	3.6	3.6	16.9	3.6	3.6	3.6	3.6	3.6	18.0	3.6	3.6	3.6	3.6	3.6	18.0	52.9
6. Service & Repair for Equipment		2.5	2.5	2.5	2.5	10.0	2.5	2.5	2.5	2.5	2.5	12.5	2.5	2.5	2.5	2.5	2.5	12.5	35.0
3/ 7. Maintenance of Nursery	38.4	51.5	64.7	84.1	103.7	342.4	123.1	142.7	149.0	155.3	161.7	731.8	161.7	161.7	161.7	161.7	161.7	808.5	1882.7
a) Central Nursery	25.2	25.2	25.2	25.2	25.2	126.0	25.7	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	378.0
b) Panchayat Nursery	13.2	26.3	39.5	58.9	78.5	216.4	97.9	117.5	123.8	130.1	136.5	605.8	136.5	136.5	136.5	136.5	136.5	682.5	1504.7
4/ 8. Maintenance of Panchayat Plant.		3.8	13.0	26.0	44.2	87.0	70.6	104.6	148.8	199.6	249.2	772.8	295.6	328.8	354.6	367.8	361.0	1707.8	2567.6
a) Fuel Wood		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
b) Fodder		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
5/ 9. Forest Demarcation	86.1	193.7	315.7	437.7	495.1	1528.3	574.0	574.0	574.0	717.5	717.5	3157.0	717.5	717.5	717.5	861.0	861.0	3874.5	8559.8
6/ 10. Maint. of Trial Plots		2.0	5.0	7.2	8.5	22.7	7.3	6.1	[illegible]	6.6	7.0	33.3	7.2	7.4	7.7	7.9	8.5	38.7	94.7
7/ 11. Maint. of National Plantation	6.5	118.5	343.7	603.7	772.0	1844.4	794.2	822.3	875.4	948.2	1004.3	4444.4	1047.7	1097.7	1118.1	1129.8	1178.5	5571.8	11860.6
8/ 12. Maint. of Panchayat Protected Forest	60.0	107.2	138.6	193.6	258.6	763.0	258.6	271.4	240.0	180.0	120.0	1070.0	60.0					60.0	1093.0
9/ 13. Implementation of Management Plant				547.9	560.2	1108.1	571.0	581.0	591.0	601.0	601.0	2945.0	601.0	601.0	601.0	601.0	601.0	3005.0	7058.1
a) National Forest				537.9	537.9	1075.8	537.9	537.9	537.9	537.9	537.9	2689.5	537.9	537.9	537.9	537.9	537.9	2689.5	6454.8
b) Panchayat Forest				10.0	22.3	32.3	33.1	43.1	53.1	63.1	63.1	255.5	63.1	63.1	63.1	63.1	63.1	385.5	603.3

1/ See appendix 13 Table 2, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8,

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	523.3	585.7	660.7	815.4	822.2	3407.3	828.2	835.2	842.0	941.6	949.1	4396.6	956.7	957.1	957.5	1052.0	1053.0	4976.9	12780.8
a) New Staff (Pay and Allowances)	411.7	474.1	549.1	703.5	710.6	2849.3	717.1	723.6	730.4	830.0	837.5	3838.6	845.1	845.5	845.9	941.0	941.4	4418.9	11106.8
b) Existing Staff (Allowances only)	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	1674.0
2. Office Supplies	12.0	15.0	15.0	15.0	15.0	72.0	15.0	15.0	15.0	15.0	15.0	75.0	15.0	15.0	15.0	15.0	15.0	75.0	222.0
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldg.							42.8	71.0	89.5	107.5	107.5	418.3	107.5	107.5	107.5	107.5	107.5	537.5	955.3
5. Ration for Horse	2.5	3.6	3.6	3.6	3.6	16.9	3.6	3.6	3.6	3.6	3.6	18.0	3.6	3.6	3.6	3.6	3.6	18.0	52.9
6. Service & Repair for Equipment		2.5	2.5	2.5	2.5	10.0	2.5	2.5	2.5	2.5	2.5	12.5	2.5	2.5	2.5	2.5	2.5	12.5	35.0
3/ 7. Maintenance of Nursery	38.4	51.5	64.7	84.1	103.7	342.4	123.1	142.7	149.0	155.3	161.7	731.8	161.7	161.7	161.7	161.7	161.7	808.5	1882.7
a) Central Nursery	25.2	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	378.0
b) Panchayat Nursery	13.2	26.3	39.5	58.9	78.5	216.4	97.9	117.5	123.8	130.1	136.5	605.8	136.5	136.5	136.5	136.5	136.5	682.5	1504.7
4/ 8. Maintenance of Panchayat Plant.		1.8	13.0	26.0	44.2	87.0	70.6	104.6	148.8	199.6	249.2	772.8	295.6	328.8	354.6	367.8	361.0	1707.8	2567.6
a) Fuel Wood		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
b) Fodder		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
5/ 9. Forest Demarcation	86.1	193.7	315.7	437.7	495.1	1528.3	574.0	574.0	574.0	717.5	717.5	3157.0	717.5	717.5	717.5	861.0	861.0	3874.5	8559.8
6/ 10. Maint. of Trial Plots		2.0	5.0	7.2	8.5	22.7	7.3	6.1	6.3	6.6	7.0	33.3	7.2	7.4	7.7	7.9	8.5	38.7	94.7
7/ 11. Maint. of National Plantation	6.5	118.5	343.7	603.7	772.0	1844.4	794.2	822.3	875.4	948.2	1004.3	4444.4	1047.7	1097.7	1118.1	1129.8	1178.5	5571.8	11860.6
8/ 12. Maint. of Panchayat Protected Forest	60.0	107.2	138.6	198.6	258.6	763.0	258.6	271.4	240.0	180.0	120.0	1070.0	60.0					60.0	1393.0
9/ 13. Implementation of Management Plant				547.9	560.2	1108.1	571.0	581.0	591.0	601.0	601.0	2945.0	601.0	601.0	601.0	601.0	601.0	3005.0	7058.1
a) National Forest				537.9	537.9	1075.8	537.9	537.9	537.9	537.9	537.9	2689.5	537.9	537.9	537.9	537.9	537.9	2689.5	6454.8
b) Panchayat Forest				10.0	22.3	32.3	33.1	43.1	53.1	63.1	63.1	255.5	63.1	63.1	63.1	63.1	63.1	385.5	603.3

1/ See appendix 13 Table 2, 2/ 52 of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8,

Nyaoli Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
14. Demonstration Saw Mill				62.5	93.8	156.3	93.8	93.8	93.8	125.0	125.0	531.4	125.0	125.0	125.0	125.0	125.0	625.0	1312.7
15. Publicity & Extension	16	16	16	16	16	80	16	16	16	16	16	80	16	16	16	16	16	80	240
TOTAL OPERATION COST	759.8	1114.5	1593.5	2820.2	3195.4	9483.4	3401.2	3539.7	3646.9	4019.4	4079.4	18686.1	4117.0	4140.8	4187.7	4451.4	4494.3	21391.2	49560.7

1/ See appendix 11, Table 2, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 7, 8/ See appendix 11, Table 8

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-d

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	341.5	413.6	439.9	466.7	493.9	2155.6	497.2	525.2	328.4	532.0	618.5	2701.3	622.7	622.8	673.9	674.0	674.0	3267.4	8124.3
a) New Staff (Pay and Allowances)	244.3	316.4	342.7	369.5	396.7	1669.6	400.0	428.0	431.2	434.8	521.3	2215.5	525.5	525.6	576.7	576.8	576.8	2781.4	6666.3
b) Existing Staff (Allowances Only)	97.2	97.2	97.2	97.2	97.2	486.0	97.2	97.2	97.2	97.2	97.2	486.0	97.2	97.2	97.2	97.2	97.2	486.0	1458.0
2. Office Supplies	10.5	14.0	14.0	14.0	14.0	66.5	14.0	14.0	14.0	14.0	14.0	70.0	14.0	14.0	14.0	14.0	14.0	70.0	206.5
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldgs.							50.0	82.9	104.4	125.4	125.4	488.1	125.4	125.4	125.4	125.4	125.4	627.0	1115.1
5. Ration for Horse	3.0	4.5	4.5	4.5	4.5	21.0	4.5	4.5	4.5	4.5	4.5	22.5	4.5	4.5	4.5	4.5	4.5	22.5	66.0
6. Service & Rep. of Equipment		3.0	3.0	3.0	3.0	12.0	3.0	3.0	3.0	3.0	3.0	15.0	3.0	3.0	3.0	3.0	3.0	15.0	42.0
3/ 7. Maintenance of Nurseries	48.4	63.0	77.6	92.4	107.1	388.5	121.8	132.8	136.5	140.2	143.9	675.2	143.9	143.9	143.9	143.9	143.9	719.5	1783.2
a) Central Nursery	33.8	33.8	33.8	33.8	33.8	169.0	33.8	33.8	33.8	33.8	33.8	169.0	33.8	33.8	33.8	33.8	33.8	169.0	507.0
b) Panchayat Nursery	14.6	29.2	43.8	58.6	73.3	219.5	88.0	99.0	102.7	106.4	110.1	506.2	110.1	110.1	110.1	110.1	110.1	550.5	1276.0
4/ 8. Maint. of Panchayat Nursery	1.8	6.2	15.2	30.7	52.9	106.8	78.1	106.2	136.8	169.2	204.9	695.2	240.1	270.1	287.9	301.3	306.2	1405.6	2207.6
a) Fuel Wood	0.9	3.1	7.6	15.8	27.7	55.1	40.3	54.4	69.7	85.9	103.7	354.0	121.3	136.3	145.2	151.6	153.4	707.8	1116.9
b) Fodder	0.9	3.1	7.6	14.9	25.2	51.7	37.8	51.8	67.1	83.3	101.2	341.2	118.8	133.8	142.7	149.7	152.8	697.8	1090.7
5/ 9. Forest Demarcation	108.7	135.9	181.2	181.2	226.5	833.5	226.5	271.8	271.8	271.8	271.8	1313.7	271.8	271.8	271.8	271.8	271.8	1359.0	3506.2
6/ 10. Maint. of Trial Plots		3.0	7.5	10.7	12.6	33.8	10.7	8.9	9.3	9.6	9.9	48.4	10.2	10.7	11.2	11.6	11.9	55.6	137.8
7/ 11. Maintenance of National Plantation	2.5	36.1	137.6	309.7	490.1	976.0	582.2	615.2	648.3	681.4	680.9	3208.0	814.8	946.7	1063.7	1245.9	1337.6	5408.7	9592.7
8/ 12. Maintenance of Panchayat Protected Forest	45.0	90.0	135.0	169.7	214.7	654.4	214.7	214.7	214.7	180.8	135.0	989.1	90.0	45.0				135.0	1778.5
9/ 13. Imple. of Mgmt. Plan				138.0	143.0	281.0	146.9	151.9	156.9	161.9	166.9	784.5	166.9	166.9	166.9	166.9	166.9	834.5	1900.0

1/ See appendix 13, Table 2d, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 5, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Mustang Catchment
(Capital cost)
'000 NRS

Attachment 12 Table 2-d (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
13. Imple. of Mgmt. Plan																			
a) National Forests				128.0	128.0	256.0	128.0	128.0	128.0	128.0	128.0	640.0	128.0	128.0	128.0	128.0	128.0	640.0	1556.0
b) Panchayat Forests				10.0	15.0	25.0	18.9	23.9	28.9	33.9	38.9	144.5	38.9	38.9	38.9	38.9	38.9	194.5	364.0
14. Demonstration Saw Mill					75.0	75.0	112.5	112.5	112.5	112.5	158.0	600.0	150.0	150.0	150.0	150.0	150.0	750.0	1425.0
15. Publicity & Extension	12	12	12	12	12	60	12	12	12	12	12	60	12	12	12	12	12	60	180.0
TOTAL OPERATING COST	588.4	796.3	1042.5	1432.6	1849.3	5709.1	2074.1	2249.6	2353.1	2417.5	2540.1	11641.0	2669.3	2786.8	2928.2	3124.3	3221.2	14729.8	32079.9

1/ See appendix 13, Table 2d, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix Table 8

Kulekhani Catchment

Foreign Exchange

'000

Attachment 12 Table 3-a

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
A. Capital Cost									
1. Buildings		184.8	40.5			225.3			225.3
2. Purchase of Land									
3. Furniture	0.6	0.2	0.1			0.9			0.9
4. Vehicle	95.0					95.0			95.0
5. Equipment	14.0	3.5	3.5	7.7	3.5	32.2	22.4		54.6
6. Nursery Establishment	33.8	28.8	14.4	14.4	14.4	105.8			105.8
7. Panchayat Forest Establishment									
a) Fuel Wood	4.0	8.1	11.7	15.1	16.5	55.4	48.0	0.3	103.7
b) Fodder	3.0	6.0	8.7	11.1	12.0	40.8	34.4	0.1	75.3
8. Seedling Distribution	0.9	1.7	2.3	2.9	2.5	10.3	10.2	7.7	28.2
9. Demarcation	0.7					0.7	1.4		2.1
10. Trial Plots	10.5	15.8	21.1	21.2	10.6	79.2	52.8	42.3	174.3
11. National Plantation	17.3	33.5	50.5	51.1	51.1	203.5	91.7		295.2
12. Prep. of Management Plan									
13. Demonstration Saw Mill		240.0				240.0			240.0
TOTAL CAPITAL COST	179.8	522.4	152.8	123.5	110.6	1,089.1	260.9	50.4	1,400.4

Kulekhani Catchment

Foreign Exchange

'000

Attachment 12 Table 3-a (cont.)

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
B. Operating Cost									
1. Staff									
2. Office Supplies	4.2	5.6	5.6	5.6	5.6	26.6	28.0	28.0	82.6
3. Maintenance of Buildings					9.3	9.3	56.4	56.4	122.1
4. Operation & Maint. of Vehicle	21.0	28.0	28.0	28.0	28.0	133.0	175.0	210.0	518.0
5. Service & Repair of Equipment		0.5	0.5	0.5	0.5	2.0	2.5	2.5	7.0
6. Maintenance of Nurseries									
a) Central Nursery	4.8	4.8	4.8	4.8	4.9	24.1	24.1	24.1	72.3
b) Panchayat Nursery				1.1	2.1	3.2	16.9	18.5	38.6
7. Maint. of Panchayat Plantation									
8. Forest Demarcation	20.3	45.6	54.0	57.3	62.4	239.6	413.4		653.0
9. Maint. of Trial Plots					0.1	0.1	1.3	2.2	3.6
10. Maint. of National Plantation	0.5	0.5	0.6	0.7	0.9	3.2	7.9	10.6	21.7
11. Maint of Panchayat Prot. Forest									
12. Implementation of Management Plan									
13. Demonstration Saw Mill		25.0	37.5	37.5	37.5	137.5	237.5	250.0	625.0
14. Publicity & Extension	5.0	5.0	5.0	5.0	5.0	25.0	25.0	25.0	75.0
TOTAL	55.8	115.0	136.0	140.5	156.3	603.6	988.0	627.3	2,218.9

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Daraundi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.8	160.2	170.6	191.2	187.3	815.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.8	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	970.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.9	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.8	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Daraundi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.8	160.2	170.6	191.2	187.3	815.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.8	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	970.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.9	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.8	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Darauadi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.0	160.2	170.6	191.2	187.3	915.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.6	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	570.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.5	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.6	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building			856.5	564.0	369.0	1789.5	360.0					360.0							2149.5
a) Forest Prefect Office (960 Sft.)			142.5			142.5													142.5
b) Officers Quarter B Type (900 Sft.)			148.5			148.5													148.5
b2) Stable			15.0			15.0													15.0
c) Staff Quarter (880 sft)			117.0			117.0													117.0
d) Range Office (2 Nos)			120.0	120.0		240.0													240.0
e) Range Quart. (2 Nos)			75.0	75.0		150.0													150.0
f) Foresters Quarters (2 Nos)			126.0	189.0	189.0	504.0													504.0
g) Forest Guards Quart. (16 Nos)				180.0	180.0	360.0	360.0					360.0							720.0
h) Central Nursery Store			112.5			112.5													112.5
2. Purchase of Land for Building (1) Rapaldi	28.0	12.0	12.0			52.0													52.0
10/																			
3. Design and Supervision Fee			17.1	11.3	7.4	35.8	7.2					7.2							43.0
4. Furniture	19.5	7.5	7.5			34.5													34.5
5. Horse with Saddle	6.0					6.0							6.0					6.0	12.0
2/																			
6. Equipment	39.0	12.0	12.0	21.0	12.0	96.0	12.0	21.0	12.0	12.0	21.0	78.0	12.0	12.0	21.0	12.0		57.0	231.0
a) Office	15.0			9.0		24.0		9.0			9.0	18.0			9.0			9.0	51.0
b) Field	24.0	12.0	12.0	12.0	12.0	72.0	12.0	12.0	12.0	12.0	12.0	60.0	12.0	12.0	12.0	12.0		48.0	180.0
3/																			
7. Nursery Establishment	163.3	148.8	148.8	148.8	148.8	758.5	148.8	148.8				297.6							1056.1
a) Central Nursery	14.5					14.5													14.5
b) Nursery	148.8	148.8	148.8	148.8	148.8	744.0	148.8	148.8				297.6							1041.6
4/																			
8. Panchayat Forest Establishment	24.4	63.2	94.6	133.8	193.1	509.6	252.3	327.8	383.[illegible]	383.6	364.5	1711.9	292.8	258.8	191.3	74.6	11.3	828.8	3050.3
a) Fuel Wood	16.4	42.0	63.2	89.5	129.1	340.2	168.8	219.5	257.4	258.1	245.5	1149.3	198.0	174.6	129.6	51.8	8.4	562.4	2051.9
b) Fodder	8.5	21.2	31.4	44.3	64.0	169.4	83.5	108.3	126.3	125.5	119.0	562.6	94.8	84.2	61.7	22.8	2.9	266.4	998.4

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Table 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11 Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 2, 10/ 5% for design and 2% for construction supervision of buildings.

Myardi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-c (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. Priv. Planting	2.9	6.1	8.7	11.9	11.9	41.5	12.6	13.2	12.6	12.6	11.9	62.9	11.9	11.9	11.9	11.9	11.9	59.5	163.9
6/ 10. Forest Demarcation	9.0					9.0	18.0					18.0	27.0					27.0	34.0
7/ 11. Trial Plots	47.3	72.4	97.4	98.5	61.0	376.6	59.7	59.2	59.2	59.2	59.2	296.5	59.2	59.2	59.2	59.2	2.5	239.3	962.4
8/ 12. National Plantation Establishment	374.4	802.5	1338.9	1469.4	1413.0	5398.2	1446.5	1443.6	1509.3	1468.8	1481.7	7339.9	1481.2	1409.4	1358.6	1346.2	283.9	5879.3	18617.4
9/ 13. Prep. of Management Plan			550.4	15.4	13.5	579.3	12.5	12.5	12.5			37.5							616.8
a) National Forest			537.9			537.9													537.9
b) Panchayat Protected Forest			12.5	15.4	13.5	41.4	12.5	12.5	12.5			37.5							78.9
14. Demonstration Saw Mill with Ins.				288.0		288.0													288.0
15. Charcoal Pilot Project									50.0	50.0		100.0							100.0
Total Capital Cost	714.3	1124.5	3143.9	2762.1	2229.7	9974.5	2329.6	2016.1	2039.3	1986.2	1938.3	10309.5	1890.1	1751.3	1642.0	1503.9	309.6	7096.9	27,380.9

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Table 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-d

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Building			999.4	655.0	430.5	2087.9	420.0					420.0							2507.9
a) Forest Proj. Office (860 Sft.)			166.3			166.3													166.3
b) Officers Quarters B Type (900 Sft.)			173.3			173.3													173.3
			17.5			17.5													17.5
c) Staff Quarter(720Sft)			136.5			136.5													136.5
d) Range Office (2 Nos)			140.0	140.0		280.0													280.0
e) Range Quarter (2 Nos)			87.5	87.5		175.0													175.0
f) Forest Quarter(8 Nos)			147.0	220.5	220.5	588.0													588.0
g) Forest Guards Quart. (16 Nos)				210.0	210.0	420.0	420.0					420.0							840.0
h) Central Nursery Store			131.3			131.3													131.3
2. Purchase of Land for Building(13 Ropanis)	28.0	12.0	12.0			52.0													52.0
10/ 3. Design & Supervision Fee			20.0	13.2	8.6	41.8	8.4					8.4							50.2
4. Furniture	22.8	8.8	8.8			40.4													40.4
5. Horse with Saddle	6.0					6.0							6.0					6.0	12.0
2/ 6. Equipment & Tools	31.5	7.0	7.0	17.5	7.0	70.0	7.0	17.5	7.0	7.0	17.5	56.0	7.0	7.0	17.5	7.0		38.5	164.3
a) Office	17.5			10.5		28.0		10.5			10.5	21.0			10.5			10.5	59.4
b) Field	14.0	7.0	7.0	7.0	7.0	42.0	7.0	7.0	7.0	7.0	7.0	35.0	7.0	7.0	7.0	7.0		28.0	105.0
3/ 7. Nursery Establishment	191.0	173.9	173.9	87.0	87.0	712.8	87.0	87.0				174.0							886.8
a) Central Nursery	17.1					17.1													17.1
b) Nursery	173.9	173.9	173.9	87.0	87.0	695.7	87.0	87.0				174.0							869.7
4/ 8. Panchayat Forest Establishment	27.2	57.4	103.6	151.2	174.3	513.7	194.8	212.9	226.7	247.9	257.9	140.2	238.7	184.5	178.9	157.2	27.3	786.6	2440.5
a) Fuel Wood	18.4	38.9	72.6	107.4	119.7	357.0	133.1	145.4	154.9	169.3	176.3	779.0	163.5	126.9	122.4	107.8	20.3	540.9	1676.9
b) Fodder	8.8	18.5	31.0	43.8	54.6	156.7	61.7	67.5	71.8	78.6	81.6	361.2	75.2	57.6	56.4	49.4	7.0	245.7	763.6
5/ 9. Seedling Distribution for Priv. Planting	2.3	3.6	4.7	5.6	5.6	21.8	5.6	5.6	5.6	5.6	5.6	28.0	6.5	6.5	6.5	6.5	6.5	32.5	82.3

1/ See appendix 8, 2/ See appendix 7, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-d (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
6/ 10. Forest Demarcation	7.9					7.9	11.8					11.8	11.8					11.8	31.5
7/ 11. Trial Plots	56.1	86.7	116.9	118.3	73.6	451.8	71.8	71.2	71.2	72.1	71.2	356.6	71.2	71.2	71.2	71.2	3.6	288.4	1096.8
8/ 12. National Plantation Establishment	97.7	303.8	636.4	903.8	969.4	2911.1	992.1	985.1	985.1	890.9	1246.7	5099.9	239.5	1521.9	671.6	1716.1	404.6	5553.7	14564.7
9/ 13. Prep. of Management Plan			141.3	6.3	4.8	152.4	6.3	6.3	6.3	6.3		25.2							177.6
a) National Forest			128.8			128.8													128.8
b) Panchayat Protected Forest			12.5	6.3	4.8	23.6	6.3	6.3	6.3	6.3		25.2							48.8
14. Demonstration Saw Mill with Instal.					300.0	300.0													300.0
15. Charcoal Pilot Project										50.0	50.0	100.0							100.0
TOTAL CAPITAL COST	470.7	653.2	2224.0	1960.9	2060.8	7369.6	1804.8	1385.6	1301.9	1778.9	1648.9	7420.1	1580.7	1791.1	845.7	1958.0	442.0	7717.5	22507.2

1/ See appendix 8, 2/ See appendix 7, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-a

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	216.1	260.6	264.4	283.2	302.3	1326.6	322.3	362.6	348.6	351.9	355.6	1741.0	145.5	132.9	133.0	133.1	133.3	677.8	3745.4
a) New Staff (Pay & Allowances)	156.8	201.3	205.1	223.9	243.0	1030.1	263.0	303.3	289.3	292.6	297.3	1444.5	86.2	73.6	73.7	73.8	74.0	381.3	2855.9
b) Existing Staff (Allowances only)	59.3	59.3	59.3	59.3	59.3	296.5	59.3	59.3	59.3	59.3	59.3	296.5	59.3	59.3	59.3	59.3	59.3	296.5	889.5
2. Office Supplies	6.0	8.0	8.0	8.0	8.0	38.0	8.0	8.0	8.0	8.0	8.0	40.0	8.0	8.0	8.0	8.0	8.0	40.0	118.0
3. Rent	12.0	12.0				24.0													24.0
2/ 4. Maintenance of Bldgs.					37.0	37.0	45.1	45.1	45.1	45.1	45.1	225.5	45.1	45.1	45.1	45.1	45.1	225.5	488.0
5. Operation & Maint. of Vehicle	30.0	40.0	40.0	40.0	40.0	190.0	50.0	50.0	50.0	50.0	50.0	250.0	60.0	60.0	60.0	60.0	60.0	300.0	740.0
6. Service & Rep. of Equipment		1.0	1.0	1.0	1.0	4.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	14.0
3/ 7. Maint. of Nurseries	28.6	38.4	43.2	52.3	61.4	223.9	63.5	65.6	67.7	67.7	67.7	332.2	67.7	67.7	67.7	67.7	67.7	338.5	894.6
a) Central Nursery	19.0	19.0	19.0	19.0	19.0	95.0	19.0	19.0	19.0	19.0	19.0	95.0	19.0	19.0	19.0	19.0	19.0	95.0	285.0
b) Panchayat Nursery	9.6	19.4	24.2	33.3	42.4	128.9	44.5	46.6	48.7	48.7	48.7	237.2	48.7	48.7	48.7	48.7	48.7	243.5	609.6
4/ 8. Maint. of Panch. Plantation	2.4	8.8	21.6	39.8	63.0	135.6	88.0	110.6	129.2	143.8	153.6	625.2	156.8	152.0	142.4	128.8	111.4	691.4	1452.2
a) Fuel Wood	1.2	4.4	10.8	19.9	31.5	67.8	44.0	55.3	64.6	71.9	76.8	312.6	78.4	76.0	71.2	64.4	55.7	345.7	726.1
b) Fodder	1.2	4.4	10.8	19.9	31.5	67.8	44.0	55.3	64.6	71.9	76.8	312.6	78.4	76.0	71.2	64.4	55.7	345.7	726.1
5/ 9. Forest Demarcation	66.1	148.8	176.3	187.3	203.9	782.4	248.0	275.5	275.5	275.5	275.5	1350.0							2132.4
6/ 10. Maint. of Trial Plots		1.7	4.2	6.0	7.0	18.9	5.7	4.3	4.4	4.6	4.9	23.9	5.0	5.3	5.4	5.5	6.0	27.2	70.0
7/ 11. Maint. of National Plantation	1.4	24.8	71.7	121.3	150.3	369.5	159.0	134.9	120.2	126.3	86.9	627.3	55.0	55.0	55.0	52.9	57.3	275.2	1272.0
a) Temporary Shade	0.4	0.4	0.4	0.4	0.4	2.0	0.4	0.4	0.4	0.4	0.4	2.0							4.0
b) Sign Board	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	15.0
c) Reparation & replacement of Tools			0.2	0.2	0.2	0.6	0.2	0.2	0.2	0.2	0.2	1.0							1.6
d) " " of Fences				0.4	1.1	1.5	2.3	3.4	4.5	5.1	5.9	21.2	6.5	6.5	6.5	6.5	6.5	32.5	55.2
e) Weeding		20.9	62.6	104.3	125.1	312.9	125.1	95.9	75.1	75.1	33.4	404.6							717.5

1/ See appendix 13, Table 7a, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Kulekhani Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
11. Maint. of National Plantation																			
f) Watcher		2.5	7.5	15.0	22.5	47.5	30.0	34.0	35.0	43.0	43.0	189.0	43.0	43.0	43.0	43.0	43.0	215.0	451.5
g) Thinning										1.5	3.0	4.5	4.5	4.5	4.5	2.4	6.8	22.7	27.2
8/ 12. Maint. of Panchayat Protected Forest	50.0	100.0	125.0	150.0	175.0	600.0	125.0	75.0	50.0	25.0		275.0							875.0
9/ 13. Implementation of Management Farm			182.4	192.4	197.4	572.2	202.4	207.4	207.4	207.4	207.4	1032.0	207.4	207.4	207.4	207.4	207.4	1037.0	2641.2
a) National Forest			172.4	172.4	172.4	517.2	177.4	172.4	172.4	172.4	172.4	862.0	172.4	172.4	172.4	172.4	172.4	862.0	2241.2
b) Panchayat Protected Forest			10.0	20.0	25.0	55.0	30.0	35.0	35.0	35.0	35.0	170.0	35.0	35.0	35.0	35.0	35.0	175.0	400.0
14. Demonstration Saw Mill		50.0	75.0	75.0	75.0	275.0	75.0	100.0	100.0	100.0	100.0	475.0	100.0	100.0	100.0	100.0	100.0	500.0	1250.0
15. Publicity & Extension	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0	10.0	50.0	150.0
TOTAL OPERATING COST	422.6	704.1	1022.8	1166.3	1331.3	4647.1	1403.0	1450.0	1417.1	1416.3	1365.7	7052.1	861.5	844.4	835.0	819.5	807.2	4167.6	15866.8

1/ See appendix 11, Table 2a, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Barguadi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ I. Staff	412.9	467.3	523.0	656.3	662.9	2722.4	748.2	755.7	763.3	770.9	778.5	3816.6	868.8	869.5	869.6	869.6	870.4	4348.0	10387.0
a) New Staff (Pay & Allowances)	351.6	406.0	461.7	595.0	601.6	2415.9	686.9	694.4	702.0	709.6	717.2	3510.1	807.5	808.0	808.3	808.6	809.1	4041.5	9967.5
b) Existing Staff (Allowances Only)	61.3	61.3	61.3	61.3	61.3	306.5	61.3	61.3	61.3	61.3	61.3	306.5	61.3	61.3	61.3	61.3	61.3	306.5	919.5
2. Office Supplies	10.0	12.0	12.0	12.0	12.0	58.0	12.0	12.0	12.0	12.0	12.0	60.0	12.0	12.0	12.0	12.0	12.0	60.0	178.0
3. Rent	12.0	12.0				24.0													24.0
2/ 4. Maintenance of Bldg.					46.2	46.2	56.3	56.3	56.3	56.3	56.3	281.5	56.3	56.3	56.3	56.3	56.3	281.5	609.2
5. Operation & Maint. of Vehicle	30.0	40.0	40.0	40.0	40.0	190.0	50.0	50.0	50.0	50.0	50.0	250.0	50.0	50.0	50.0	50.0	50.0	300.0	740.0
6. Service & Repair of Equipments		2.0	2.0	2.0	2.0	8.0	2.0	2.0	2.0	2.0	2.0	10.0	2.0	2.0	2.0	2.0	2.0	10.0	28.0
3/ 7. Maintenance of Nurseries	37.9	54.8	77.3	107.7	132.5	410.2	165.6	193.7	229.1	239.7	250.2	1083.3	260.8	260.8	260.8	260.8	260.8	1304.0	2797.5
a) Central Nursery	21.0	21.0	21.0	21.0	21.0	105.0	21.0	21.0	21.0	21.0	21.0	105.0	21.0	21.0	21.0	21.0	21.0	105.0	315.0
b) Panchayat Nursery	16.9	33.8	56.3	86.7	111.5	305.2	144.6	177.7	208.1	218.7	229.2	978.3	239.8	239.8	239.8	239.8	239.8	1199.0	2482.5
4/ 8. Maint. of Panchayat Plantation	1.6	7.6	16.8	33.4	66.8	131.2	105.2	152.6	209.8	284.0	360.6	1112.2	433.6	492.2	532.8	535.4	514.2	2508.2	3751.6
a) Fuel Wood	0.8	3.8	8.4	19.2	33.4	65.6	52.6	76.3	104.9	142.0	180.3	556.1	216.8	246.1	266.4	267.7	257.1	1254.1	1875.8
b) Fodder	0.8	3.8	8.4	19.2	33.4	65.6	52.6	76.3	104.9	142.0	180.3	556.1	216.8	246.1	266.4	267.7	257.1	1254.1	1875.8
5/ 9. Forest Demarcation	73.4	165.1	269.1	373.0	421.9	1302.5	611.5	611.5	611.5	611.5	611.5	3057.5	733.8	733.8	733.8	733.8	733.8	3669.0	8029.0
6/ 10. Maintenance of Trial Plot		1.7	4.2	5.8	6.6	18.3	5.8	5.0	5.0	5.1	5.2	26.1	5.2	5.2	5.2	5.2	5.5	26.3	70.7
7/ 11. Maint. of National Plantation	5.4	80.1	230.5	412.6	530.6	1259.2	569.4	569.2	669.5	725.5	755.9	3289.5	778.0	806.0	851.2	924.8	991.6	4352.0	8900.7
8/ 12. Maint. of Panchayat Protected Forest	73.0	141.5	241.5	341.5	416.5	1214.0	442.7	475.0	475.0	400.0	300.0	2092.7	200.0	100.0	100.0			400.0	3707.5
9/ 13. Implementation of Mgmt. Plan			528.2	541.7	561.7	1631.6	581.7	596.7	616.7	636.7	656.7	3088.5	656.7	656.7	656.7	656.7	656.7	3283.5	8003.6

1/ See appendix 13, Table 2b, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11 Table 5 & 6, 8/ See appendix 11 Table 7, 9/ See appendix 11, Table 8

Attachment 12 Table 2-b (cont.)

Dargandi Catchment
(Capital Cost)
'000 NRS

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
13. Implementation of Mgmt. Plan																			
a. National Forest			513.4	513.4	513.4	1540.2	513.4	513.4	513.4	513.4	513.4	2567.0	513.4	513.4	513.4	513.4	513.4	2567.0	6674.2
b. Panchayat Forest			14.0	28.1	48.1	91.4	62.1	81.2	103.2	123.3	143.3	521.5	143.3	143.3	143.3	143.3	143.3	716.5	1329.4
14. Demonstration Saw Mill			50.0	75.0	75.0	200.0	75.0	75.0	100.0	100.0	100.0	450.0	100.0	100.0	100.0	100.0	100.0	500.0	1150.0
15. Publicity and Extension	25	25	25	25	25	125	25	25	25	25	25	125	25	25	25	25	25	125	375.0
TOTAL OPERATING COST	682.0	1009.1	2019.6	2631.0	2999.7	9341.4	3450.4	3504.7	3525.2	2918.7	3963.9	18702.9	4192.6	4179.3	4265.4	4241.9	4288.3	21167.5	49251.8

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	523.3	585.7	660.7	815.4	822.2	3407.3	828.2	835.2	842.0	941.6	949.1	4396.6	956.7	957.1	957.5	1052.0	1053.0	4976.9	12780.8
a) New Staff (Pay and Allowances)	411.7	474.1	549.1	703.5	710.6	2849.3	717.1	723.6	730.4	830.0	837.5	3838.6	845.1	845.5	845.9	941.0	941.4	4418.9	11106.8
b) Existing Staff (Allowances only)	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	1674.0
2. Office Supplies	12.0	15.0	15.0	15.0	15.0	72.0	15.0	15.0	15.0	15.0	15.0	75.0	15.0	15.0	15.0	15.0	15.0	75.0	222.0
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldg.							42.8	71.0	89.5	107.5	107.5	418.3	107.5	107.5	107.5	107.5	107.5	537.5	955.8
5. Ration for Horse	2.5	3.6	3.6	3.6	3.6	16.9	3.6	3.6	3.6	3.6	3.6	18.0	3.6	3.6	3.6	3.6	3.6	18.0	52.9
6. Service & Repair for Equipment		2.5	2.5	2.5	2.5	10.0	2.5	2.5	2.5	2.5	2.5	12.5	2.5	2.5	2.5	2.5	2.5	12.5	35.0
3/ 7. Maintenance of Nursery	38.4	51.5	64.7	84.1	103.7	342.4	123.1	142.7	149.0	155.3	161.7	731.8	161.7	161.7	161.7	161.7	161.7	808.5	1882.7
a) Central Nursery	25.2	25.2	25.2	25.2	25.2	126.0	25.7	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	378.0
b) Panchayat Nursery	13.2	26.3	39.5	58.9	78.5	216.4	97.9	117.5	123.8	130.1	136.5	605.8	136.5	136.5	136.5	136.5	136.5	682.5	1504.7
4/ 8. Maintenance of Panchayat Plant.		3.8	13.0	26.0	44.2	87.0	70.6	104.6	148.8	199.6	249.2	772.8	295.6	328.8	354.6	367.8	361.0	1707.8	2567.6
a) Fuel Wood		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
b) Fodder		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
5/ 9. Forest Demarcation	86.1	193.7	315.7	437.7	495.1	1528.3	574.0	574.0	574.0	717.5	717.5	3157.0	717.5	717.5	717.5	861.0	861.0	3874.5	8559.8
6/ 10. Maint. of Trial Plots		2.0	5.0	7.2	8.5	22.7	7.3	6.1	[illegible]	6.6	7.0	33.3	7.2	7.4	7.7	7.9	8.5	38.7	94.7
7/ 11. Maint. of National Plantation	6.5	118.5	343.7	603.7	772.0	1844.4	794.2	822.3	875.4	948.2	1004.3	4444.4	1047.7	1097.7	1118.1	1129.8	1178.5	5571.8	11860.6
8/ 12. Maint. of Panchayat Protected Forest	60.0	107.2	138.6	193.6	258.6	763.0	258.6	271.4	240.0	180.0	120.0	1070.0	60.0					60.0	1093.0
9/ 13. Implementation of Management Plant				547.9	560.2	1108.1	571.0	581.0	591.0	601.0	601.0	2945.0	601.0	601.0	601.0	601.0	601.0	3005.0	7058.1
a) National Forest				537.9	537.9	1075.8	537.9	537.9	537.9	537.9	537.9	2689.5	537.9	537.9	537.9	537.9	537.9	2689.5	6454.8
b) Panchayat Forest				10.0	22.3	32.3	33.1	43.1	53.1	63.1	63.1	255.5	63.1	63.1	63.1	63.1	63.1	385.5	603.3

1/ See appendix 13 Table 2, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8,

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	523.3	585.7	660.7	815.4	822.2	3407.3	828.2	835.2	842.0	941.6	949.1	4396.6	956.7	957.1	957.5	1052.0	1053.0	4976.9	12780.8
a) New Staff (Pay and Allowances)	411.7	474.1	549.1	703.5	710.6	2849.3	717.1	723.6	730.4	830.0	837.5	3838.6	845.1	845.5	845.9	941.0	941.4	4418.9	11106.8
b) Existing Staff (Allowances only)	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	1674.0
2. Office Supplies	12.0	15.0	15.0	15.0	15.0	72.0	15.0	15.0	15.0	15.0	15.0	75.0	15.0	15.0	15.0	15.0	15.0	75.0	222.0
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldg.							42.8	71.0	89.5	107.5	107.5	418.3	107.5	107.5	107.5	107.5	107.5	537.5	955.3
5. Ration for Horse	2.5	3.6	3.6	3.6	3.6	16.9	3.6	3.6	3.6	3.6	3.6	18.0	3.6	3.6	3.6	3.6	3.6	18.0	52.9
6. Service & Repair for Equipment		2.5	2.5	2.5	2.5	10.0	2.5	2.5	2.5	2.5	2.5	12.5	2.5	2.5	2.5	2.5	2.5	12.5	35.0
3/ 7. Maintenance of Nursery	38.4	51.5	64.7	84.1	103.7	342.4	123.1	142.7	149.0	155.3	161.7	731.8	161.7	161.7	161.7	161.7	161.7	808.5	1882.7
a) Central Nursery	25.2	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	378.0
b) Panchayat Nursery	13.2	26.3	39.5	58.9	78.5	216.4	97.9	117.5	123.8	130.1	136.5	605.8	136.5	136.5	136.5	136.5	136.5	682.5	1504.7
4/ 8. Maintenance of Panchayat Plant.		1.8	13.0	26.0	44.2	87.0	70.6	104.6	148.8	199.6	249.2	772.8	295.6	328.8	354.6	367.8	361.0	1707.8	2567.6
a) Fuel Wood		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
b) Fodder		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
5/ 9. Forest Demarcation	86.1	193.7	315.7	437.7	495.1	1528.3	574.0	574.0	574.0	717.5	717.5	3157.0	717.5	717.5	717.5	861.0	861.0	3874.5	8559.8
6/ 10. Maint. of Trial Plots		2.0	5.0	7.2	8.5	22.7	7.3	6.1	6.3	6.6	7.0	33.3	7.2	7.4	7.7	7.9	8.5	38.7	94.7
7/ 11. Maint. of National Plantation	6.5	118.5	343.7	603.7	772.0	1844.4	794.2	822.3	875.4	948.2	1004.3	4444.4	1047.7	1097.7	1118.1	1129.8	1178.5	5571.8	11860.6
8/ 12. Maint. of Panchayat Protected Forest	60.0	107.2	138.6	198.6	258.6	763.0	258.6	271.4	240.0	180.0	120.0	1070.0	60.0					60.0	1393.0
9/ 13. Implementation of Management Plant				547.9	560.2	1108.1	571.0	581.0	591.0	601.0	601.0	2945.0	601.0	601.0	601.0	601.0	601.0	3005.0	7058.1
a) National Forest				537.9	537.9	1075.8	537.9	537.9	537.9	537.9	537.9	2689.5	537.9	537.9	537.9	537.9	537.9	2689.5	6454.8
b) Panchayat Forest				10.0	22.3	32.3	33.1	43.1	53.1	63.1	63.1	255.5	63.1	63.1	63.1	63.1	63.1	385.5	603.3

1/ See appendix 13 Table 2, 2/ 52 of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8,

Nyaoli Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
14. Demonstration Saw Mill				62.5	93.8	156.3	93.8	93.8	93.8	125.0	125.0	531.4	125.0	125.0	125.0	125.0	125.0	625.0	1312.7
15. Publicity & Extension	16	16	16	16	16	80	16	16	16	16	16	80	16	16	16	16	16	80	240
TOTAL OPERATION COST	759.8	1114.5	1593.5	2820.2	3195.4	9483.4	3401.2	3539.7	3646.9	4019.4	4079.4	18686.1	4117.0	4140.8	4187.7	4451.4	4494.3	21391.2	49560.7

1/ See appendix 11, Table 2, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 7, 8/ See appendix 11, Table 8

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-d

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	341.5	413.6	439.9	466.7	493.9	2155.6	497.2	525.2	328.4	532.0	618.5	2701.3	622.7	622.8	673.9	674.0	674.0	3267.4	8124.3
a) New Staff (Pay and Allowances)	244.3	316.4	342.7	369.5	396.7	1669.6	400.0	428.0	431.2	434.8	521.3	2215.5	525.5	525.6	576.7	576.8	576.8	2781.4	6666.3
b) Existing Staff (Allowances Only)	97.2	97.2	97.2	97.2	97.2	486.0	97.2	97.2	97.2	97.2	97.2	486.0	97.2	97.2	97.2	97.2	97.2	486.0	1458.0
2. Office Supplies	10.5	14.0	14.0	14.0	14.0	66.5	14.0	14.0	14.0	14.0	14.0	70.0	14.0	14.0	14.0	14.0	14.0	70.0	206.5
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldgs.							50.0	82.9	104.4	125.4	125.4	488.1	125.4	125.4	125.4	125.4	125.4	627.0	1115.1
5. Ration for Horse	3.0	4.5	4.5	4.5	4.5	21.0	4.5	4.5	4.5	4.5	4.5	22.5	4.5	4.5	4.5	4.5	4.5	22.5	66.0
6. Service & Rep. of Equipment		3.0	3.0	3.0	3.0	12.0	3.0	3.0	3.0	3.0	3.0	15.0	3.0	3.0	3.0	3.0	3.0	15.0	42.0
3/ 7. Maintenance of Nurseries	48.4	63.0	77.6	92.4	107.1	388.5	121.8	132.8	136.5	140.2	143.9	675.2	143.9	143.9	143.9	143.9	143.9	719.5	1783.2
a) Central Nursery	33.8	33.8	33.8	33.8	33.8	169.0	33.8	33.8	33.8	33.8	33.8	169.0	33.8	33.8	33.8	33.8	33.8	169.0	507.0
b) Panchayat Nursery	14.6	29.2	43.8	58.6	73.3	219.5	88.0	99.0	102.7	106.4	110.1	506.2	110.1	110.1	110.1	110.1	110.1	550.5	1276.0
4/ 8. Maint. of Panchayat Nursery	1.8	6.2	15.2	30.7	52.9	106.8	78.1	106.2	136.8	169.2	204.9	695.2	240.1	270.1	287.9	301.3	306.2	1405.6	2207.6
a) Fuel Wood	0.9	3.1	7.6	15.8	27.7	55.1	40.3	54.4	69.7	85.9	103.7	354.0	121.3	136.3	145.2	151.6	153.4	707.8	1116.9
b) Fodder	0.9	3.1	7.6	14.9	25.2	51.7	37.8	51.8	67.1	83.3	101.2	341.2	118.8	133.8	142.7	149.7	152.8	697.8	1090.7
5/ 9. Forest Demarcation	108.7	135.9	181.2	181.2	226.5	833.5	226.5	271.8	271.8	271.8	271.8	1313.7	271.8	271.8	271.8	271.8	271.8	1359.0	3506.2
6/ 10. Maint. of Trial Plots		3.0	7.5	10.7	12.6	33.8	10.7	8.9	9.3	9.6	9.9	48.4	10.2	10.7	11.2	11.6	11.9	55.6	137.8
7/ 11. Maintenance of National Plantation	2.5	36.1	137.6	309.7	490.1	976.0	582.2	615.2	648.3	681.4	680.9	3208.0	814.8	946.7	1063.7	1245.9	1337.6	5408.7	9592.7
8/ 12. Maintenance of Panchayat Protected Forest	45.0	90.0	135.0	169.7	214.7	654.4	214.7	214.7	214.7	180.8	135.0	989.1	90.0	45.0				135.0	1778.5
9/ 13. Imple. of Mgmt. Plan				138.0	143.0	281.0	146.9	151.9	156.9	161.9	166.9	784.5	166.9	166.9	166.9	166.9	166.9	834.5	1900.0

1/ See appendix 13, Table 2d, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 5, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Mustang Catchment
(Capital cost)
'000 NRS

Attachment 12 Table 2-d (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
13. Imple. of Mgmt. Plan																			
a) National Forests				128.0	128.0	256.0	128.0	128.0	128.0	128.0	128.0	640.0	128.0	128.0	128.0	128.0	128.0	640.0	1556.0
b) Panchayat Forests				10.0	15.0	25.0	18.9	23.9	28.9	33.9	38.9	144.5	38.9	38.9	38.9	38.9	38.9	194.5	364.0
14. Demonstration Saw Mill					75.0	75.0	112.5	112.5	112.5	112.5	158.0	600.0	150.0	150.0	150.0	150.0	150.0	750.0	1425.0
15. Publicity & Extension	12	12	12	12	12	60	12	12	12	12	12	60	12	12	12	12	12	60	180.0
TOTAL OPERATING COST	588.4	796.3	1042.5	1432.6	1849.3	5709.1	2074.1	2249.6	2353.1	2417.5	2540.1	11641.0	2669.3	2786.8	2928.2	3124.3	3221.2	14729.8	32079.9

1/ See appendix 13, Table 2d, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix Table 8

Kulekhani Catchment

Foreign Exchange

'000

Attachment 12 Table 3-a

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
A. Capital Cost									
1. Buildings		184.8	40.5			225.3			225.3
2. Purchase of Land									
3. Furniture	0.6	0.2	0.1			0.9			0.9
4. Vehicle	95.0					95.0			95.0
5. Equipment	14.0	3.5	3.5	7.7	3.5	32.2	22.4		54.6
6. Nursery Establishment	33.8	28.8	14.4	14.4	14.4	105.8			105.8
7. Panchayat Forest Establishment									
a) Fuel Wood	4.0	8.1	11.7	15.1	16.5	55.4	48.0	0.3	103.7
b) Fodder	3.0	6.0	8.7	11.1	12.0	40.8	34.4	0.1	75.3
8. Seedling Distribution	0.9	1.7	2.3	2.9	2.5	10.3	10.2	7.7	28.2
9. Demarcation	0.7					0.7	1.4		2.1
10. Trial Plots	10.5	15.8	21.1	21.2	10.6	79.2	52.8	42.3	174.3
11. National Plantation	17.3	33.5	50.5	51.1	51.1	203.5	91.7		295.2
12. Prep. of Management Plan									
13. Demonstration Saw Mill		240.0				240.0			240.0
TOTAL CAPITAL COST	179.8	522.4	152.8	123.5	110.6	1,089.1	260.9	50.4	1,400.4

Kulekhani Catchment

Foreign Exchange

'000

Attachment 12 Table 3-a (cont.)

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
B. Operating Cost									
1. Staff									
2. Office Supplies	4.2	5.6	5.6	5.6	5.6	26.6	28.0	28.0	82.6
3. Maintenance of Buildings					9.3	9.3	56.4	56.4	122.1
4. Operation & Maint. of Vehicle	21.0	28.0	28.0	28.0	28.0	133.0	175.0	210.0	518.0
5. Service & Repair of Equipment		0.5	0.5	0.5	0.5	2.0	2.5	2.5	7.0
6. Maintenance of Nurseries									
a) Central Nursery	4.8	4.8	4.8	4.8	4.9	24.1	24.1	24.1	72.3
b) Panchayat Nursery				1.1	2.1	3.2	16.9	18.5	38.6
7. Maint. of Panchayat Plantation									
8. Forest Demarcation	20.3	45.6	54.0	57.3	62.4	239.6	413.4		653.0
9. Maint. of Trial Plots					0.1	0.1	1.3	2.2	3.6
10. Maint. of National Plantation	0.5	0.5	0.6	0.7	0.9	3.2	7.9	10.6	21.7
11. Maint of Panchayat Prot. Forest									
12. Implementation of Management Plan									
13. Demonstration Saw Mill		25.0	37.5	37.5	37.5	137.5	237.5	250.0	625.0
14. Publicity & Extension	5.0	5.0	5.0	5.0	5.0	25.0	25.0	25.0	75.0
TOTAL	55.8	115.0	136.0	140.5	156.3	603.6	988.0	627.3	2,218.9

Kulekhani Catchment
(Capital Cost)
'000 NRS
Continued

Attachment 12 Table 1-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. for Com. Planting	5.1	9.5	13.2	16.6	14.6	59.0	13.0	11.4	10.4	9.3	8.8	52.9	8.8	8.8	8.8	8.8	8.8	44.0	155.9
6/ 10. Forest Demarcation	6.0					6.0	12.0					12.0							18.0
7/ 11. Trial Plots	32.1	49.4	66.5	67.3	35.5	250.8	34.3	33.8	33.8	33.8	33.8	169.5	33.8	33.8	33.8	33.8	16.7	151.9	572.2
8/ 12. National Plantation Establishment	68.0	417.7	234.3	254.4	259.8	964.2	100.5	172.8	144.4	34.3	8.7	546.7							512.9
9/ 13. Prep. of Management Plan		184.9	12.5	6.3	6.3	210.0	6.3					6.3							216.3
a) National Forest		172.4				172.4													172.4
b) Panchayet Protected Forest		12.5	12.5	6.3	6.3	37.6	6.3					6.3							43.9
14. Demonst. saw mill with Install.		280.0				280.0													280.0
15. Charcoal Pilot Proj.								50.0	50.0			100.0							100.0
Total Capital Cost	532.0	1627.1	667.7	561.4	543.7	1931.9	420.8	415.2	351.9	158.0	99.3	1445.2	49.6	43.4	42.6	42.6	25.5	203.7	5580.8

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a and 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Daraundi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building		923.9	202.5			1126.4													1126.4
a) Forest Project office (860 sq. ft.)		118.8				118.8													118.8
b) Office Quarter B Type with Carage (900 x 150 sq. ft.)		143.8				143.8													143.8
c) Staff Quarter(Bloq.ft.)		97.5				97.5													97.5
d) Range Office		100.0				100.0													100.0
e) Range Quarter		62.5				62.5													62.5
f) Forester's Quarter (4 Nos)		157.5	52.5			210.0													210.0
g) Forest Guard Quarters (8 Nos)		150.0	150.0			300.0													300.0
h) Central Nursery Store		93.8				93.8													93.8
2. Purchase of Land for Building(10 ropanis)	28.0	12.0				40.0													40.0
10/																			
3. Design and Supervision fee		18.5	4.1			22.6													22.6
4. Furniture	16.1	5.0	1.3			22.6													22.6
5. Vehicle (4 Wheeldrive diesel Jeep)	200.0					200.0													200.0
2/																			
6. Equipments and Tools	32.5	10.0	10.0	17.5	10.0	80.0	10.0	17.5	10.0	10.0	17.5	65.0	10.0	10.0	17.5	10.0		47.5	192.5
a) Office	12.5			7.5		20.0		7.5			7.5	15.0			7.5			7.5	42.5
b) Field	20.0	10.0	10.0	10.0	10.0	60.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0		40.0	150.0
3/																			
7. Nursery Establishment	198.1	186.0	248.0	248.0	186.0	1066.1	248.0	248.0	248.0			744.0							1810.1
a) Central Nursery	12.1					12.1													12.1
b) Nursery	186.0	186.0	248.0	248.0	186.0	1054.0	248.0	248.0	248.0			744.0							1798.0
4/																			
8. Panchayat forest Establishment	40.4	91.7	154.4	208.7	232.0	777.2	352.1	426.7	548.4	560.5	574.6	2486.3	500.4	414.2	139.0	29.7	3.2	1136.5	4400.0
a) Fuel-Wood	26.8	61.1	101.2	139.9	189.0	520.0	236.3	286.5	367.8	393.3	387.3	1671.2	338.1	280.2	130.4	22.1	2.4	773.2	2964.4

1/ See appendix 8, 2/ See appendix 5, See appendix 11, Tables 1a and 1B, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Daraundi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.8	160.2	170.6	191.2	187.3	815.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.8	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	970.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.9	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.8	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Darauadi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.0	160.2	170.6	191.2	187.3	915.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.6	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	570.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.5	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.6	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Attachment 12 Table 1-b (cont.)

Darauadi Catchment
(Capital Cost)
'000 NRS
(Continued)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
8. Pancharat Forest Establishment																			
b) Fodder	13.6	30.6	51.2	68.3	93.0	257.2	115.0	160.2	170.6	191.2	187.3	915.1	162.3	134.0	58.6	7.6	0.8	363.3	1435.6
5/ 9. Seedling Dist. Priv. Planting	7.5	12.8	19.1	24.6	26.5	91.0	27.6	27.7	30.4	31.5	32.0	150.2	32.0	32.0	32.0	32.0	32.0	160.0	401.2
6/ 10. Forest Demarcation	7.5					7.5	15.0					15.0	22.5					22.5	45.0
7/ 11. Trial Plots	39.4	60.4	81.2	82.1	62.7	325.8	62.0	61.7	61.7	61.7	61.7	308.8	61.7	61.7	61.7	61.0	2.6	248.7	883.3
8/ 12. National Plantation Establishment	249.9	535.0	570.0	1167.8	919.1	3791.8	1064.0	1128.9	1153.9	1127.9	1091.4	5566.1	1093.7	1141.9	1214.8	1231.2	261.2	4942.3	14300.2
9/ 13. Prep. of Management Plan		531.9	16.5	25.0	25.0	598.8	18.8	25.0	25.0	25.0		93.8							692.6
a) National Forest		513.4				513.4													513.4
b) Panchayat Protected Forest		18.5	16.9	25.0	25.0	85.4	18.8	25.0	25.0	25.0		93.8							179.2
14. Demonstration Saw Mill with Instal.			280.0			280.0													280.0
15. Charcoal Plot Proj.								50.0	50.0			100.0							100.0
TOTAL CAPITAL COST	819.9	2387.2	1937.5	1773.9	1511.3	8429.8	1797.5	1936.5	2127.4	1840.6	1777.2	9629.2	1719.6	1659.8	1515.0	1363.9	299.0	6557.5	24516.5

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/																			
1. Building			856.5	564.0	369.0	1789.5	360.0					360.0							2149.5
a) Forest Prefect Office (960 Sft.)			142.5			142.5													142.5
b) Officers Quarter B Type (900 Sft.)			148.5			148.5													148.5
b2) Stable			15.0			15.0													15.0
c) Staff Quarter (880 sft)			117.0			117.0													117.0
d) Range Office (2 Nos)			120.0	120.0		240.0													240.0
e) Range Quart. (2 Nos)			75.0	75.0		150.0													150.0
f) Foresters Quarters (2 Nos)			126.0	189.0	189.0	504.0													504.0
g) Forest Guards Quart. (16 Nos)				180.0	180.0	360.0	360.0					360.0							720.0
h) Central Nursery Store			112.5			112.5													112.5
2. Purchase of Land for Building (1) Rapaldi	28.0	12.0	12.0			52.0													52.0
10/																			
3. Design and Supervision Fee			17.1	11.3	7.4	35.8	7.2					7.2							43.0
4. Furniture	19.5	7.5	7.5			34.5													34.5
5. Horse with Saddle	6.0					6.0							6.0					6.0	12.0
2/																			
6. Equipment	39.0	12.0	12.0	21.0	12.0	96.0	12.0	21.0	12.0	12.0	21.0	78.0	12.0	12.0	21.0	12.0		57.0	231.0
a) Office	15.0			9.0		24.0		9.0			9.0	18.0			9.0			9.0	51.0
b) Field	24.0	12.0	12.0	12.0	12.0	72.0	12.0	12.0	12.0	12.0	12.0	60.0	12.0	12.0	12.0	12.0		48.0	180.0
3/																			
7. Nursery Establishment	163.3	148.8	148.8	148.8	148.8	758.5	148.8	148.8				297.6							1056.1
a) Central Nursery	14.5					14.5													14.5
b) Nursery	148.8	148.8	148.8	148.8	148.8	744.0	148.8	148.8				297.6							1041.6
4/																			
8. Panchayat Forest Establishment	24.4	63.2	94.6	133.8	193.1	509.6	252.3	327.8	383.[illegible]	383.6	364.5	1711.9	292.8	258.8	191.3	74.6	11.3	828.8	3050.3
a) Fuel Wood	16.4	42.0	63.2	89.5	129.1	340.2	168.8	219.5	257.4	258.1	245.5	1149.3	198.0	174.6	129.6	51.8	8.4	562.4	2051.9
b) Fodder	8.5	21.2	31.4	44.3	64.0	169.4	83.5	108.3	126.3	125.5	119.0	562.6	94.8	84.2	61.7	22.8	2.9	266.4	998.4

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Table 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11 Table 1, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 2, 10/ 5% for design and 2% for construction supervision of buildings.

Myardi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-c (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
5/ 9. Seedling Dist. Priv. Planting	2.9	6.1	8.7	11.9	11.9	41.5	12.6	13.2	12.6	12.6	11.9	62.9	11.9	11.9	11.9	11.9	11.9	59.5	163.9
6/ 10. Forest Demarcation	9.0					9.0	18.0					18.0	27.0					27.0	34.0
7/ 11. Trial Plots	47.3	72.4	97.4	98.5	61.0	376.6	59.7	59.2	59.2	59.2	59.2	296.5	59.2	59.2	59.2	59.2	2.5	239.3	962.4
8/ 12. National Plantation Establishment	374.4	802.5	1338.9	1469.4	1413.0	5398.2	1446.5	1443.6	1509.3	1468.8	1481.7	7339.9	1481.2	1409.4	1358.6	1346.2	283.9	5879.3	18617.4
9/ 13. Prep. of Management Plan			550.4	15.4	13.5	579.3	12.5	12.5	12.5			37.5							616.8
a) National Forest			537.9			537.9													537.9
b) Panchayat Protected Forest			12.5	15.4	13.5	41.4	12.5	12.5	12.5			37.5							78.9
14. Demonstration Saw Mill with Ins.				288.0		288.0													288.0
15. Charcoal Pilot Project									50.0	50.0		100.0							100.0
Total Capital Cost	714.3	1124.5	3143.9	2762.1	2229.7	9974.5	2329.6	2016.1	2039.3	1986.2	1938.3	10309.5	1890.1	1751.3	1642.0	1503.9	309.6	7096.9	27,380.9

1/ See appendix 8, 2/ See appendix 9, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Table 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-d

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Building			999.4	655.0	430.5	2087.9	420.0					420.0							2507.9
a) Forest Proj. Office (860 Sft.)			166.3			166.3													166.3
b) Officers Quarters B Type (900 Sft.)			173.3			173.3													173.3
			17.5			17.5													17.5
c) Staff Quarter(720Sft)			136.5			136.5													136.5
d) Range Office (2 Nos)			140.0	140.0		280.0													280.0
e) Range Quarter (2 Nos)			87.5	87.5		175.0													175.0
f) Forest Quarter(8 Nos)			147.0	220.5	220.5	588.0													588.0
g) Forest Guards Quart. (16 Nos)				210.0	210.0	420.0	420.0					420.0							840.0
h) Central Nursery Store			131.3			131.3													131.3
2. Purchase of Land for Building(13 Ropanis)	28.0	12.0	12.0			52.0													52.0
10/ 3. Design & Supervision Fee			20.0	13.2	8.6	41.8	8.4					8.4							50.2
4. Furniture	22.8	8.8	8.8			40.4													40.4
5. Horse with Saddle	6.0					6.0							6.0					6.0	12.0
2/ 6. Equipment & Tools	31.5	7.0	7.0	17.5	7.0	70.0	7.0	17.5	7.0	7.0	17.5	56.0	7.0	7.0	17.5	7.0		38.5	164.3
a) Office	17.5			10.5		28.0		10.5			10.5	21.0			10.5			10.5	59.4
b) Field	14.0	7.0	7.0	7.0	7.0	42.0	7.0	7.0	7.0	7.0	7.0	35.0	7.0	7.0	7.0	7.0		28.0	105.0
3/ 7. Nursery Establishment	191.0	173.9	173.9	87.0	87.0	712.8	87.0	87.0				174.0							886.8
a) Central Nursery	17.1					17.1													17.1
b) Nursery	173.9	173.9	173.9	87.0	87.0	695.7	87.0	87.0				174.0							869.7
4/ 8. Panchayat Forest Establishment	27.2	57.4	103.6	151.2	174.3	513.7	194.8	212.9	226.7	247.9	257.9	140.2	238.7	184.5	178.9	157.2	27.3	786.6	2440.5
a) Fuel Wood	18.4	38.9	72.6	107.4	119.7	357.0	133.1	145.4	154.9	169.3	176.3	779.0	163.5	126.9	122.4	107.8	20.3	540.9	1676.9
b) Fodder	8.8	18.5	31.0	43.8	54.6	156.7	61.7	67.5	71.8	78.6	81.6	361.2	75.2	57.6	56.4	49.4	7.0	245.7	763.6
5/ 9. Seedling Distribution for Priv. Planting	2.3	3.6	4.7	5.6	5.6	21.8	5.6	5.6	5.6	5.6	5.6	28.0	6.5	6.5	6.5	6.5	6.5	32.5	82.3

1/ See appendix 8, 2/ See appendix 7, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix 11, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 1-d (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
6/ 10. Forest Demarcation	7.9					7.9	11.8					11.8	11.8					11.8	31.5
7/ 11. Trial Plots	56.1	86.7	116.9	118.3	73.6	451.8	71.8	71.2	71.2	72.1	71.2	356.6	71.2	71.2	71.2	71.2	3.6	288.4	1096.8
8/ 12. National Plantation Establishment	97.7	303.8	636.4	903.8	969.4	2911.1	992.1	985.1	985.1	890.9	1246.7	5099.9	239.5	1521.9	671.6	1716.1	404.6	5553.7	14564.7
9/ 13. Prep. of Management Plan			141.3	6.3	4.8	152.4	6.3	6.3	6.3	6.3		25.2							177.6
a) National Forest			128.8			128.8													128.8
b) Panchayat Protected Forest			12.5	6.3	4.8	23.6	6.3	6.3	6.3	6.3		25.2							48.8
14. Demonstration Saw Mill with Instal.					300.0	300.0													300.0
15. Charcoal Pilot Project										50.0	50.0	100.0							100.0
TOTAL CAPITAL COST	470.7	653.2	2224.0	1960.9	2060.8	7369.6	1804.8	1385.6	1301.9	1778.9	1648.9	7420.1	1580.7	1791.1	845.7	1958.0	442.0	7717.5	22507.2

1/ See appendix 8, 2/ See appendix 7, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 1b, 6/ See appendix, Table 3, 7/ See appendix 11, Table 4, 8/ See appendix 11, Table 5, 9/ See appendix 11, Table 8, 10/ 3% for design and 2% for construction supervision of buildings.

Kulekhani Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-a

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	216.1	260.6	264.4	283.2	302.3	1326.6	322.3	362.6	348.6	351.9	355.6	1741.0	145.5	132.9	133.0	133.1	133.3	677.8	3745.4
a) New Staff (Pay & Allowances)	156.8	201.3	205.1	223.9	243.0	1030.1	263.0	303.3	289.3	292.6	297.3	1444.5	86.2	73.6	73.7	73.8	74.0	381.3	2855.9
b) Existing Staff (Allowances only)	59.3	59.3	59.3	59.3	59.3	296.5	59.3	59.3	59.3	59.3	59.3	296.5	59.3	59.3	59.3	59.3	59.3	296.5	889.5
2. Office Supplies	6.0	8.0	8.0	8.0	8.0	38.0	8.0	8.0	8.0	8.0	8.0	40.0	8.0	8.0	8.0	8.0	8.0	40.0	118.0
3. Rent	12.0	12.0				24.0													24.0
2/ 4. Maintenance of Bldgs.					37.0	37.0	45.1	45.1	45.1	45.1	45.1	225.5	45.1	45.1	45.1	45.1	45.1	225.5	488.0
5. Operation & Maint. of Vehicle	30.0	40.0	40.0	40.0	40.0	190.0	50.0	50.0	50.0	50.0	50.0	250.0	60.0	60.0	60.0	60.0	60.0	300.0	740.0
6. Service & Rep. of Equipment		1.0	1.0	1.0	1.0	4.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	14.0
3/ 7. Maint. of Nurseries	28.6	38.4	43.2	52.3	61.4	223.9	63.5	65.6	67.7	67.7	67.7	332.2	67.7	67.7	67.7	67.7	67.7	338.5	894.6
a) Central Nursery	19.0	19.0	19.0	19.0	19.0	95.0	19.0	19.0	19.0	19.0	19.0	95.0	19.0	19.0	19.0	19.0	19.0	95.0	285.0
b) Panchayat Nursery	9.6	19.4	24.2	33.3	42.4	128.9	44.5	46.6	48.7	48.7	48.7	237.2	48.7	48.7	48.7	48.7	48.7	243.5	609.6
4/ 8. Maint. of Panch. Plantation	2.4	8.8	21.6	39.8	63.0	135.6	88.0	110.6	129.2	143.8	153.6	625.2	156.8	152.0	142.4	128.8	111.4	691.4	1452.2
a) Fuel Wood	1.2	4.4	10.8	19.9	31.5	67.8	44.0	55.3	64.6	71.9	76.8	312.6	78.4	76.0	71.2	64.4	55.7	345.7	726.1
b) Fodder	1.2	4.4	10.8	19.9	31.5	67.8	44.0	55.3	64.6	71.9	76.8	312.6	78.4	76.0	71.2	64.4	55.7	345.7	726.1
5/ 9. Forest Demarcation	66.1	148.8	176.3	187.3	203.9	782.4	248.0	275.5	275.5	275.5	275.5	1350.0							2132.4
6/ 10. Maint. of Trial Plots		1.7	4.2	6.0	7.0	18.9	5.7	4.3	4.4	4.6	4.9	23.9	5.0	5.3	5.4	5.5	6.0	27.2	70.0
7/ 11. Maint. of National Plantation	1.4	24.8	71.7	121.3	150.3	369.5	159.0	134.9	120.2	126.3	86.9	627.3	55.0	55.0	55.0	52.9	57.3	275.2	1272.0
a) Temporary Shade	0.4	0.4	0.4	0.4	0.4	2.0	0.4	0.4	0.4	0.4	0.4	2.0							4.0
b) Sign Board	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	5.0	15.0
c) Reparation & replacement of Tools			0.2	0.2	0.2	0.6	0.2	0.2	0.2	0.2	0.2	1.0							1.6
d) " " of Fences				0.4	1.1	1.5	2.3	3.4	4.5	5.1	5.9	21.2	6.5	6.5	6.5	6.5	6.5	32.5	55.2
e) Weeding		20.9	62.6	104.3	125.1	312.9	125.1	95.9	75.1	75.1	33.4	404.6							717.5

1/ See appendix 13, Table 7a, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Kulekhani Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-a (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
11. Maint. of National Plantation																			
f) Watcher		2.5	7.5	15.0	22.5	47.5	30.0	34.0	35.0	43.0	43.0	189.0	43.0	43.0	43.0	43.0	43.0	215.0	451.5
g) Thinning										1.5	3.0	4.5	4.5	4.5	4.5	2.4	6.8	22.7	27.2
8/ 12. Maint. of Panchayat Protected Forest	50.0	100.0	125.0	150.0	175.0	600.0	125.0	75.0	50.0	25.0		275.0							875.0
9/ 13. Implementation of Management Farm			182.4	192.4	197.4	572.2	202.4	207.4	207.4	207.4	207.4	1032.0	207.4	207.4	207.4	207.4	207.4	1037.0	2641.2
a) National Forest			172.4	172.4	172.4	517.2	177.4	172.4	172.4	172.4	172.4	862.0	172.4	172.4	172.4	172.4	172.4	862.0	2241.2
b) Panchayat Protected Forest			10.0	20.0	25.0	55.0	30.0	35.0	35.0	35.0	35.0	170.0	35.0	35.0	35.0	35.0	35.0	175.0	400.0
14. Demonstration Saw Mill		50.0	75.0	75.0	75.0	275.0	75.0	100.0	100.0	100.0	100.0	475.0	100.0	100.0	100.0	100.0	100.0	500.0	1250.0
15. Publicity & Extension	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0	10.0	50.0	10.0	10.0	10.0	10.0	10.0	50.0	150.0
TOTAL OPERATING COST	422.6	704.1	1022.8	1166.3	1331.3	4647.1	1403.0	1450.0	1417.1	1416.3	1365.7	7052.1	861.5	844.4	835.0	819.5	807.2	4167.6	15866.8

1/ See appendix 11, Table 2a, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a and 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Barguadi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-b

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ I. Staff	412.9	467.3	523.0	656.3	662.9	2722.4	748.2	755.7	763.3	770.9	778.5	3816.6	868.8	869.5	869.6	869.6	870.4	4348.0	10387.0
a) New Staff (Pay & Allowances)	351.6	406.0	461.7	595.0	601.6	2415.9	686.9	694.4	702.0	709.6	717.2	3510.1	807.5	808.0	808.3	808.6	809.1	4041.5	9967.5
b) Existing Staff (Allowances Only)	61.3	61.3	61.3	61.3	61.3	306.5	61.3	61.3	61.3	61.3	61.3	306.5	61.3	61.3	61.3	61.3	61.3	306.5	919.5
2. Office Supplies	10.0	12.0	12.0	12.0	12.0	58.0	12.0	12.0	12.0	12.0	12.0	60.0	12.0	12.0	12.0	12.0	12.0	60.0	178.0
3. Rent	12.0	12.0				24.0													24.0
2/ 4. Maintenance of Bldg.					46.2	46.2	56.3	56.3	56.3	56.3	56.3	281.5	56.3	56.3	56.3	56.3	56.3	281.5	609.2
5. Operation & Maint. of Vehicle	30.0	40.0	40.0	40.0	40.0	190.0	50.0	50.0	50.0	50.0	50.0	250.0	50.0	50.0	50.0	50.0	50.0	300.0	740.0
6. Service & Repair of Equipments		2.0	2.0	2.0	2.0	8.0	2.0	2.0	2.0	2.0	2.0	10.0	2.0	2.0	2.0	2.0	2.0	10.0	28.0
3/ 7. Maintenance of Nurseries	37.9	54.8	77.3	107.7	132.5	410.2	165.6	193.7	229.1	239.7	250.2	1083.3	260.8	260.8	260.8	260.8	260.8	1304.0	2797.5
a) Central Nursery	21.0	21.0	21.0	21.0	21.0	105.0	21.0	21.0	21.0	21.0	21.0	105.0	21.0	21.0	21.0	21.0	21.0	105.0	315.0
b) Panchayat Nursery	16.9	33.8	56.3	86.7	111.5	305.2	144.6	177.7	208.1	218.7	229.2	978.3	239.8	239.8	239.8	239.8	239.8	1199.0	2482.5
4/ 8. Maint. of Panchayat Plantation	1.6	7.6	16.8	33.4	66.8	131.2	105.2	152.6	209.8	284.0	360.6	1112.2	433.6	492.2	532.8	535.4	514.2	2508.2	3751.6
a) Fuel Wood	0.8	3.8	8.4	19.2	33.4	65.6	52.6	76.3	104.9	142.0	180.3	556.1	216.8	246.1	266.4	267.7	257.1	1254.1	1875.8
b) Fodder	0.8	3.8	8.4	19.2	33.4	65.6	52.6	76.3	104.9	142.0	180.3	556.1	216.8	246.1	266.4	267.7	257.1	1254.1	1875.8
5/ 9. Forest Demarcation	73.4	165.1	269.1	373.0	421.9	1302.5	611.5	611.5	611.5	611.5	611.5	3057.5	733.8	733.8	733.8	733.8	733.8	3669.0	8029.0
6/ 10. Maintenance of Trial Plot		1.7	4.2	5.8	6.6	18.3	5.8	5.0	5.0	5.1	5.2	26.1	5.2	5.2	5.2	5.2	5.5	26.3	70.7
7/ 11. Maint. of National Plantation	5.4	80.1	230.5	412.6	530.6	1259.2	569.4	569.2	669.5	725.5	755.9	3289.5	778.0	806.0	851.2	924.8	991.6	4352.0	8900.7
8/ 12. Maint. of Panchayat Protected Forest	73.0	141.5	241.5	341.5	416.5	1214.0	442.7	475.0	475.0	400.0	300.0	2092.7	200.0	100.0	100.0			400.0	3707.5
9/ 13. Implementation of Mgmt. Plan			528.2	541.7	561.7	1631.6	581.7	596.7	616.7	636.7	656.7	3088.5	656.7	656.7	656.7	656.7	656.7	3283.5	8003.6

1/ See appendix 13, Table 2b, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11 Table 5 & 6, 8/ See appendix 11 Table 7, 9/ See appendix 11, Table 8

Attachment 12 Table 2-b (cont.)

Dargandi Catchment
(Capital Cost)
'000 NRS

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
13. Implementation of Mgmt. Plan																			
a. National Forest			513.4	513.4	513.4	1540.2	513.4	513.4	513.4	513.4	513.4	2567.0	513.4	513.4	513.4	513.4	513.4	2567.0	6674.2
b. Panchayat Forest			14.0	28.1	48.1	91.4	62.1	81.2	103.2	123.3	143.3	521.5	143.3	143.3	143.3	143.3	143.3	716.5	1329.4
14. Demonstration Saw Mill			50.0	75.0	75.0	200.0	75.0	75.0	100.0	100.0	100.0	450.0	100.0	100.0	100.0	100.0	100.0	500.0	1150.0
15. Publicity and Extension	25	25	25	25	25	125	25	25	25	25	25	125	25	25	25	25	25	125	375.0
TOTAL OPERATING COST	682.0	1009.1	2019.6	2631.0	2999.7	9341.4	3450.4	3504.7	3525.2	2918.7	3963.9	18702.9	4192.6	4179.3	4265.4	4241.9	4288.3	21167.5	49251.8

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	523.3	585.7	660.7	815.4	822.2	3407.3	828.2	835.2	842.0	941.6	949.1	4396.6	956.7	957.1	957.5	1052.0	1053.0	4976.9	12780.8
a) New Staff (Pay and Allowances)	411.7	474.1	549.1	703.5	710.6	2849.3	717.1	723.6	730.4	830.0	837.5	3838.6	845.1	845.5	845.9	941.0	941.4	4418.9	11106.8
b) Existing Staff (Allowances only)	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	1674.0
2. Office Supplies	12.0	15.0	15.0	15.0	15.0	72.0	15.0	15.0	15.0	15.0	15.0	75.0	15.0	15.0	15.0	15.0	15.0	75.0	222.0
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldg.							42.8	71.0	89.5	107.5	107.5	418.3	107.5	107.5	107.5	107.5	107.5	537.5	955.8
5. Ration for Horse	2.5	3.6	3.6	3.6	3.6	16.9	3.6	3.6	3.6	3.6	3.6	18.0	3.6	3.6	3.6	3.6	3.6	18.0	52.9
6. Service & Repair for Equipment		2.5	2.5	2.5	2.5	10.0	2.5	2.5	2.5	2.5	2.5	12.5	2.5	2.5	2.5	2.5	2.5	12.5	35.0
3/ 7. Maintenance of Nursery	38.4	51.5	64.7	84.1	103.7	342.4	123.1	142.7	149.0	155.3	161.7	731.8	161.7	161.7	161.7	161.7	161.7	808.5	1882.7
a) Central Nursery	25.2	25.2	25.2	25.2	25.2	126.0	25.7	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	378.0
b) Panchayat Nursery	13.2	26.3	39.5	58.9	78.5	216.4	97.9	117.5	123.8	130.1	136.5	605.8	136.5	136.5	136.5	136.5	136.5	682.5	1504.7
4/ 8. Maintenance of Panchayat Plant.		3.8	13.0	26.0	44.2	87.0	70.6	104.6	148.8	199.6	249.2	772.8	295.6	328.8	354.6	367.8	361.0	1707.8	2567.6
a) Fuel Wood		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
b) Fodder		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
5/ 9. Forest Demarcation	86.1	193.7	315.7	437.7	495.1	1528.3	574.0	574.0	574.0	717.5	717.5	3157.0	717.5	717.5	717.5	861.0	861.0	3874.5	8559.8
6/ 10. Maint. of Trial Plots		2.0	5.0	7.2	8.5	22.7	7.3	6.1	[illegible]	6.6	7.0	33.3	7.2	7.4	7.7	7.9	8.5	38.7	94.7
7/ 11. Maint. of National Plantation	6.5	118.5	343.7	603.7	772.0	1844.4	794.2	822.3	875.4	948.2	1004.3	4444.4	1047.7	1097.7	1118.1	1129.8	1178.5	5571.8	11860.6
8/ 12. Maint. of Panchayat Protected Forest	60.0	107.2	138.6	193.6	258.6	763.0	258.6	271.4	240.0	180.0	120.0	1070.0	60.0					60.0	1093.0
9/ 13. Implementation of Management Plant				547.9	560.2	1108.1	571.0	581.0	591.0	601.0	601.0	2945.0	601.0	601.0	601.0	601.0	601.0	3005.0	7058.1
a) National Forest				537.9	537.9	1075.8	537.9	537.9	537.9	537.9	537.9	2689.5	537.9	537.9	537.9	537.9	537.9	2689.5	6454.8
b) Panchayat Forest				10.0	22.3	32.3	33.1	43.1	53.1	63.1	63.1	255.5	63.1	63.1	63.1	63.1	63.1	385.5	603.3

1/ See appendix 13 Table 2, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8,

Myagdi Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	523.3	585.7	660.7	815.4	822.2	3407.3	828.2	835.2	842.0	941.6	949.1	4396.6	956.7	957.1	957.5	1052.0	1053.0	4976.9	12780.8
a) New Staff (Pay and Allowances)	411.7	474.1	549.1	703.5	710.6	2849.3	717.1	723.6	730.4	830.0	837.5	3838.6	845.1	845.5	845.9	941.0	941.4	4418.9	11106.8
b) Existing Staff (Allowances only)	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	111.6	111.6	111.6	111.6	111.6	558.0	1674.0
2. Office Supplies	12.0	15.0	15.0	15.0	15.0	72.0	15.0	15.0	15.0	15.0	15.0	75.0	15.0	15.0	15.0	15.0	15.0	75.0	222.0
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldg.							42.8	71.0	89.5	107.5	107.5	418.3	107.5	107.5	107.5	107.5	107.5	537.5	955.3
5. Ration for Horse	2.5	3.6	3.6	3.6	3.6	16.9	3.6	3.6	3.6	3.6	3.6	18.0	3.6	3.6	3.6	3.6	3.6	18.0	52.9
6. Service & Repair for Equipment		2.5	2.5	2.5	2.5	10.0	2.5	2.5	2.5	2.5	2.5	12.5	2.5	2.5	2.5	2.5	2.5	12.5	35.0
3/ 7. Maintenance of Nursery	38.4	51.5	64.7	84.1	103.7	342.4	123.1	142.7	149.0	155.3	161.7	731.8	161.7	161.7	161.7	161.7	161.7	808.5	1882.7
a) Central Nursery	25.2	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	25.2	25.2	25.2	25.2	25.2	126.0	378.0
b) Panchayat Nursery	13.2	26.3	39.5	58.9	78.5	216.4	97.9	117.5	123.8	130.1	136.5	605.8	136.5	136.5	136.5	136.5	136.5	682.5	1504.7
4/ 8. Maintenance of Panchayat Plant.		1.8	13.0	26.0	44.2	87.0	70.6	104.6	148.8	199.6	249.2	772.8	295.6	328.8	354.6	367.8	361.0	1707.8	2567.6
a) Fuel Wood		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
b) Fodder		1.9	6.5	13.0	22.1	43.5	35.3	52.3	74.4	99.8	124.6	386.4	147.8	164.4	177.3	183.9	180.5	853.9	1283.8
5/ 9. Forest Demarcation	86.1	193.7	315.7	437.7	495.1	1528.3	574.0	574.0	574.0	717.5	717.5	3157.0	717.5	717.5	717.5	861.0	861.0	3874.5	8559.8
6/ 10. Maint. of Trial Plots		2.0	5.0	7.2	8.5	22.7	7.3	6.1	6.3	6.6	7.0	33.3	7.2	7.4	7.7	7.9	8.5	38.7	94.7
7/ 11. Maint. of National Plantation	6.5	118.5	343.7	603.7	772.0	1844.4	794.2	822.3	875.4	948.2	1004.3	4444.4	1047.7	1097.7	1118.1	1129.8	1178.5	5571.8	11860.6
8/ 12. Maint. of Panchayat Protected Forest	60.0	107.2	138.6	198.6	258.6	763.0	258.6	271.4	240.0	180.0	120.0	1070.0	60.0					60.0	1393.0
9/ 13. Implementation of Management Plant				547.9	560.2	1108.1	571.0	581.0	591.0	601.0	601.0	2945.0	601.0	601.0	601.0	601.0	601.0	3005.0	7058.1
a) National Forest				537.9	537.9	1075.8	537.9	537.9	537.9	537.9	537.9	2689.5	537.9	537.9	537.9	537.9	537.9	2689.5	6454.8
b) Panchayat Forest				10.0	22.3	32.3	33.1	43.1	53.1	63.1	63.1	255.5	63.1	63.1	63.1	63.1	63.1	385.5	603.3

1/ See appendix 13 Table 2, 2/ 52 of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8,

Nyaoli Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-c (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
14. Demonstration Saw Mill				62.5	93.8	156.3	93.8	93.8	93.8	125.0	125.0	531.4	125.0	125.0	125.0	125.0	125.0	625.0	1312.7
15. Publicity & Extension	16	16	16	16	16	80	16	16	16	16	16	80	16	16	16	16	16	80	240
TOTAL OPERATION COST	759.8	1114.5	1593.5	2820.2	3195.4	9483.4	3401.2	3539.7	3646.9	4019.4	4079.4	18686.1	4117.0	4140.8	4187.7	4451.4	4494.3	21391.2	49560.7

1/ See appendix 11, Table 2, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 7, 8/ See appendix 11, Table 8

Mustang Catchment
(Capital Cost)
'000 NRS

Attachment 12 Table 2-d

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
1/ 1. Staff	341.5	413.6	439.9	466.7	493.9	2155.6	497.2	525.2	328.4	532.0	618.5	2701.3	622.7	622.8	673.9	674.0	674.0	3267.4	8124.3
a) New Staff (Pay and Allowances)	244.3	316.4	342.7	369.5	396.7	1669.6	400.0	428.0	431.2	434.8	521.3	2215.5	525.5	525.6	576.7	576.8	576.8	2781.4	6666.3
b) Existing Staff (Allowances Only)	97.2	97.2	97.2	97.2	97.2	486.0	97.2	97.2	97.2	97.2	97.2	486.0	97.2	97.2	97.2	97.2	97.2	486.0	1458.0
2. Office Supplies	10.5	14.0	14.0	14.0	14.0	66.5	14.0	14.0	14.0	14.0	14.0	70.0	14.0	14.0	14.0	14.0	14.0	70.0	206.5
3. Rent	15.0	15.0	15.0			45.0													45.0
2/ 4. Maintenance of Bldgs.							50.0	82.9	104.4	125.4	125.4	488.1	125.4	125.4	125.4	125.4	125.4	627.0	1115.1
5. Ration for Horse	3.0	4.5	4.5	4.5	4.5	21.0	4.5	4.5	4.5	4.5	4.5	22.5	4.5	4.5	4.5	4.5	4.5	22.5	66.0
6. Service & Rep. of Equipment		3.0	3.0	3.0	3.0	12.0	3.0	3.0	3.0	3.0	3.0	15.0	3.0	3.0	3.0	3.0	3.0	15.0	42.0
3/ 7. Maintenance of Nurseries	48.4	63.0	77.6	92.4	107.1	388.5	121.8	132.8	136.5	140.2	143.9	675.2	143.9	143.9	143.9	143.9	143.9	719.5	1783.2
a) Central Nursery	33.8	33.8	33.8	33.8	33.8	169.0	33.8	33.8	33.8	33.8	33.8	169.0	33.8	33.8	33.8	33.8	33.8	169.0	507.0
b) Panchayat Nursery	14.6	29.2	43.8	58.6	73.3	219.5	88.0	99.0	102.7	106.4	110.1	506.2	110.1	110.1	110.1	110.1	110.1	550.5	1276.0
4/ 8. Maint. of Panchayat Nursery	1.8	6.2	15.2	30.7	52.9	106.8	78.1	106.2	136.8	169.2	204.9	695.2	240.1	270.1	287.9	301.3	306.2	1405.6	2207.6
a) Fuel Wood	0.9	3.1	7.6	15.8	27.7	55.1	40.3	54.4	69.7	85.9	103.7	354.0	121.3	136.3	145.2	151.6	153.4	707.8	1116.9
b) Fodder	0.9	3.1	7.6	14.9	25.2	51.7	37.8	51.8	67.1	83.3	101.2	341.2	118.8	133.8	142.7	149.7	152.8	697.8	1090.7
5/ 9. Forest Demarcation	108.7	135.9	181.2	181.2	226.5	833.5	226.5	271.8	271.8	271.8	271.8	1313.7	271.8	271.8	271.8	271.8	271.8	1359.0	3506.2
6/ 10. Maint. of Trial Plots		3.0	7.5	10.7	12.6	33.8	10.7	8.9	9.3	9.6	9.9	48.4	10.2	10.7	11.2	11.6	11.9	55.6	137.8
7/ 11. Maintenance of National Plantation	2.5	36.1	137.6	309.7	490.1	976.0	582.2	615.2	648.3	681.4	680.9	3208.0	814.8	946.7	1063.7	1245.9	1337.6	5408.7	9592.7
8/ 12. Maintenance of Panchayat Protected Forest	45.0	90.0	135.0	169.7	214.7	654.4	214.7	214.7	214.7	180.8	135.0	989.1	90.0	45.0				135.0	1778.5
9/ 13. Imple. of Mgmt. Plan				138.0	143.0	281.0	146.9	151.9	156.9	161.9	166.9	784.5	166.9	166.9	166.9	166.9	166.9	834.5	1900.0

1/ See appendix 13, Table 2d, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 5, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix 11, Table 8

Mustang Catchment
(Capital cost)
'000 NRS

Attachment 12 Table 2-d (cont.)

Particulars	Y 1	Y 2	Y 3	Y 4	Y 5	Total	Y 6	Y 7	Y 8	Y 9	Y 10	Total	Y 11	Y 12	Y 13	Y 14	Y 15	Total	Grand Total
13. Imple. of Mgmt. Plan																			
a) National Forests				128.0	128.0	256.0	128.0	128.0	128.0	128.0	128.0	640.0	128.0	128.0	128.0	128.0	128.0	640.0	1556.0
b) Panchayat Forests				10.0	15.0	25.0	18.9	23.9	28.9	33.9	38.9	144.5	38.9	38.9	38.9	38.9	38.9	194.5	364.0
14. Demonstration Saw Mill					75.0	75.0	112.5	112.5	112.5	112.5	158.0	600.0	150.0	150.0	150.0	150.0	150.0	750.0	1425.0
15. Publicity & Extension	12	12	12	12	12	60	12	12	12	12	12	60	12	12	12	12	12	60	180.0
TOTAL OPERATING COST	588.4	796.3	1042.5	1432.6	1849.3	5709.1	2074.1	2249.6	2353.1	2417.5	2540.1	11641.0	2669.3	2786.8	2928.2	3124.3	3221.2	14729.8	32079.9

1/ See appendix 13, Table 2d, 2/ 5% of the cost from 4th year onwards, 3/ See appendix 11, Tables 1a & 1b, 4/ See appendix 11, Tables 2a & 2b, 5/ See appendix 11, Table 3, 6/ See appendix 11, Table 4, 7/ See appendix 11, Table 5 & 6, 8/ See appendix 11, Table 7, 9/ See appendix Table 8

Kulekhani Catchment

Foreign Exchange

'000

Attachment 12 Table 3-a

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
A. Capital Cost									
1. Buildings		184.8	40.5			225.3			225.3
2. Purchase of Land									
3. Furniture	0.6	0.2	0.1			0.9			0.9
4. Vehicle	95.0					95.0			95.0
5. Equipment	14.0	3.5	3.5	7.7	3.5	32.2	22.4		54.6
6. Nursery Establishment	33.8	28.8	14.4	14.4	14.4	105.8			105.8
7. Panchayat Forest Establishment									
a) Fuel Wood	4.0	8.1	11.7	15.1	16.5	55.4	48.0	0.3	103.7
b) Fodder	3.0	6.0	8.7	11.1	12.0	40.8	34.4	0.1	75.3
8. Seedling Distribution	0.9	1.7	2.3	2.9	2.5	10.3	10.2	7.7	28.2
9. Demarcation	0.7					0.7	1.4		2.1
10. Trial Plots	10.5	15.8	21.1	21.2	10.6	79.2	52.8	42.3	174.3
11. National Plantation	17.3	33.5	50.5	51.1	51.1	203.5	91.7		295.2
12. Prep. of Management Plan									
13. Demonstration Saw Mill		240.0				240.0			240.0
TOTAL CAPITAL COST	179.8	522.4	152.8	123.5	110.6	1,089.1	260.9	50.4	1,400.4

Kulekhani Catchment

Foreign Exchange

'000

Attachment 12 Table 3-a (cont.)

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
B. Operating Cost									
1. Staff									
2. Office Supplies	4.2	5.6	5.6	5.6	5.6	26.6	28.0	28.0	82.6
3. Maintenance of Buildings					9.3	9.3	56.4	56.4	122.1
4. Operation & Maint. of Vehicle	21.0	28.0	28.0	28.0	28.0	133.0	175.0	210.0	518.0
5. Service & Repair of Equipment		0.5	0.5	0.5	0.5	2.0	2.5	2.5	7.0
6. Maintenance of Nurseries									
a) Central Nursery	4.8	4.8	4.8	4.8	4.9	24.1	24.1	24.1	72.3
b) Panchayat Nursery				1.1	2.1	3.2	16.9	18.5	38.6
7. Maint. of Panchayat Plantation									
8. Forest Demarcation	20.3	45.6	54.0	57.3	62.4	239.6	413.4		653.0
9. Maint. of Trial Plots					0.1	0.1	1.3	2.2	3.6
10. Maint. of National Plantation	0.5	0.5	0.6	0.7	0.9	3.2	7.9	10.6	21.7
11. Maint of Panchayat Prot. Forest									
12. Implementation of Management Plan									
13. Demonstration Saw Mill		25.0	37.5	37.5	37.5	137.5	237.5	250.0	625.0
14. Publicity & Extension	5.0	5.0	5.0	5.0	5.0	25.0	25.0	25.0	75.0
TOTAL	55.8	115.0	136.0	140.5	156.3	603.6	988.0	627.3	2,218.9

Baraundi Catchment

Foreign Exchange

'000

Attachment 12 Table 3-b

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
A. Capital Cost									
1. Buildings		184.8	40.5			225.3			225.3
2. Purchase of Land									
3. Furniture	0.6	0.2	0.1			0.9			0.9
4. Vehicle	95.0					95.0			95.0
5. Equipment	18.2	5.6	5.6	9.8	5.6	44.8	36.4	26.6	107.8
6. Nursery Establishment	48.2	43.3	57.7	57.7	43.3	250.2	173.0		423.2
7. Panchayat Forest Establishment									
a) Fuel Wood	3.7	8.3	13.8	18.4	24.8	69.0	216.2	93.0	378.2
b) Fodder	2.8	6.2	10.2	13.5	18.3	51.0	158.0	65.7	274.7
8. Seedling Distribution	1.3	2.1	3.1	4.1	4.3	14.9	23.7	26.2	64.8
9. Demarcation	0.7					0.7	1.4	2.1	4.2
10. Trial Plots	10.5	15.8	21.1	21.2	15.8	84.4	79.2	63.4	227.0
11. National Plantation	56.6	107.1	178.0	216.7	152.5	710.9	991.7	844.2	2,546.8
12. Prep. of Management Plan									
13. Demonstration Saw Mill			240.0			240.0			240.0
TOTAL	237.6	373.4	570.1	341.4	264.6	1,787.1	1,679.6	1,121.2	4,587.9

Baraundi Catchment

Foreign Exchange

'000

Attachment 12 Table 3-b

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
A. Capital Cost									
1. Buildings		184.8	40.5			225.3			225.3
2. Purchase of Land									
3. Furniture	0.6	0.2	0.1			0.9			0.9
4. Vehicle	95.0					95.0			95.0
5. Equipment	18.2	5.6	5.6	9.8	5.6	44.8	36.4	26.6	107.8
6. Nursery Establishment	48.2	43.3	57.7	57.7	43.3	250.2	173.0		423.2
7. Panchayat Forest Establishment									
a) Fuel Wood	3.7	8.3	13.8	18.4	24.8	69.0	216.2	93.0	378.2
b) Fodder	2.8	6.2	10.2	13.5	18.3	51.0	158.0	65.7	274.7
8. Seedling Distribution	1.3	2.1	3.1	4.1	4.3	14.9	23.7	26.2	64.8
9. Demarcation	0.7					0.7	1.4	2.1	4.2
10. Trial Plots	10.5	15.8	21.1	21.2	15.8	84.4	79.2	63.4	227.0
11. National Plantation	56.6	107.1	178.0	216.7	152.5	710.9	991.7	844.2	2,546.8
12. Prep. of Management Plan									
13. Demonstration Saw Mill			240.0			240.0			240.0
TOTAL	237.6	373.4	570.1	341.4	264.6	1,787.1	1,679.6	1,121.2	4,587.9

Baraundi Catchment

Foreign Exchange

'000

Attachment 12 Table 3-b (cont.)

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
B. Operating Cost									
1. Staff									
2. Office Supplies	5.7	6.7	6.7	6.7	6.7	34.5	33.6	33.5	99.7
3. Maintenance of Buildings					9.2	9.2	56.3	56.3	121.8
4. Operation & Maint. of Vehicles	21.0	28.0	28.0	28.0	28.0	133.0	175.0	210.0	518.0
5. Service & Repair of Equipment		0.8	0.8	0.8	0.8	3.2	4.0	4.0	11.2
6. Maintenance of Nurseries									
a) Central Nursery	4.8	4.8	4.8	4.8	4.9	24.1	24.1	24.1	72.3
b) Panchayat Nursery				1.6	3.2	4.8	46.0	76.6	127.4
7. Maint. of Panchayat Plantation									
8. Forest Demarcation	20.3	45.6	74.3	108.0	116.4	359.4	843.8	1,012.5	2,215.7
9. Maint. of Trial Plots					0.1	0.1	1.4	2.7	4.2
10. Maint. of National Plantation	2.0	2.0	2.1	2.4	2.9	11.4	29.2	54.2	94.8
11. Maint. of Panchayat Prot. Forest									
12. Implementation of Mgmt. Plan									
13. Demonstration of Saw Mill			25.0	37.5	37.5	100.0	225.0	250.0	575.0
14. Publicity & Extension	12.5	12.5	12.5	12.5	12.5	62.5	62.5	62.5	187.5
TOTAL	66.3	100.4	154.2	197.2	222.2	740.2	1,500.9	1,786.5	4,027.6

Myagdi Catchment

Foreign Exchange

'000

Attachment 12 Table 3-c

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
A. Capital Cost									
1. Building			142.8	94.0	61.5	298.3	60.0		358.3
2. Purchase of Land									
3. Furniture	0.7	0.3	0.2			1.2			1.2
4. Horse with Saddle									
5. Equipment	18.2	5.6	5.6	9.8	5.6	44.8	36.4	26.6	107.8
6. Nursery Establishment	33.8	28.8	28.8	28.8	28.8	149.0	57.7		172.9
7. Panchayat Forest Establishment									
a) Fuel Wood	1.2	3.2	6.8	10.6	14.2	36.0	124.9	56.8	217.7
b) Fodder	0.9	2.4	5.1	7.8	10.5	26.7	91.1	40.3	158.1
8. Seedling Distribution	0.4	0.8	1.2	1.6	1.6	5.6	8.6	8.1	22.3
9. Demarcation	0.7					0.7	1.4	2.1	4.2
10. Trial Plots	10.5	15.8	21.1	21.2	12.7	81.3	63.3	50.7	195.3
11. National Plantation	70.89	133.8	215.1	221.5	205.1	846.3	1,086.4	831.0	2,763.7
12. Prep. of Management Plan									
13. Demonstration Saw Mill				240.0		240.0			240.0
TOTAL	137.2	190.7	426.7	635.3	340.0	1,729.9	1,529.8	1,015.6	4,275.3

Pyapdi Catchment

Foreign Exchange

'000

Attachment 12 Table 3-c (cont.)

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
B. Operating Cost									
1. Staff									
2. Office Supplies	5.6	7.0	7.0	7.0	7.0	33.o	35.0	35.0	103.6
3. Maintenance of Building							69.7	89.6	159.3
4. Horse with Saddle									
5. Service & Repair of Equipment		0.8	0.8	0.8	0.9	3.3	4.3	4.3	11.9
6. Maintenance of Nurseries									
a) Central Nursery	4.8	4.8	4.8	4.8	4.9	24.1	24.2	24.2	72.5
b) Panchayat Nursery				1.1	2.1	3.2	26.4	37.0	66.6
7. Maint. of Panchayat P'antation									
8. Forest Demarcation	20.3	45.6	74.3	102.8	116.4	359.4	742.5	911.3	2,013.2
9. Maintenance of Trial Plots					0.1	0.1	1.3	2.4	3.8
10. Maint. of National Plantation	2.0	2.0	2.1	2.5	3.1	11.7	32.3	60.0	104.0
11. Maint. of Panchayat Prot. Forest									
12. Implementation of Mgmt. Plan									
13. Demonstration Saw Mill				25.0	37.5	62.5	212.6	250.0	525.1
14. Publicity & Extension	8.0	8.0	8.0	8.0	8.0	40.0	40.0	40.0	120.0
TOTAL	40.7	68.2	97.0	152.0	180.0	537.9	1,188.3	1,453.8	3,180.0

Mustang Catchment

Foreign Exchange

'000

Attachment 12 Table 3-d

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
A. Capital Cost									
1. Building			142.8	95.0	61.5	298.3	60.0		358.3
2. Purchase of Land									
3. Furniture	0.6	0.3	0.3			1.2			1.2
4. Horse with Saddle									
5. Equipment	12.6	2.8	2.8	7.0	2.8	28.0	22.4	15.4	65.8
6. Nursery Establishment	33.9	28.8	28.8	14.4	14.4	120.3	28.8		149.1
7. Panchayat Forest Establishment									
a) Fuel Wood	1.5	3.2	5.8	8.5	9.2	28.2	59.8	39.7	127.7
b) Fodder	1.1	2.4	3.9	5.4	6.7	19.6	43.6	28.3	91.4
8. Seedling Distribution	0.2	0.3	0.3	0.6	0.5	1.9	2.7	3.2	7.8
9. Demarcation	0.5					0.5	0.8	0.8	2.1
10. Trial Plots	10.5	15.8	21.1	21.2	12.7	81.3	63.3	50.7	195.3
11. National Plantation	15.1	39.9	80.3	108.1	109.1	352.5	574.3	705.9	1,630.7
12. Preparation of Management Plan									
13. Demonstration Saw Mill					240.0	240.0			240.0
TOTAL	76.0	93.5	286.1	259.2	456.9	1,171.7	855.7	842.0	2,869.4

Mustang Catchment

Foreign Exchange

'000

Attachment 12 Table 3-d (cont.)

ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	1st Five Years	2nd Five Years	3rd Five Years	TOTAL
B. Operating Cost									
1. Staff	4.2	5.6	5.6	5.6	5.6	26.6	28.0	28.0	82.6
2. Office Supplies							69.7	89.6	159.3
3. Maintenance of Buildings									
4. Horse with Saddle		0.8	0.8	0.9	0.9	3.4	4.3	4.3	12.0
5. Service & Repair of Equipment									
6. Maintenance of Nurseries									
a) Central Nursery	4.8	4.8	4.8	4.8	4.9	24.1	24.1	24.1	72.3
b) Panchayat Nursery				1.1	2.1	3.2	2.1	26.4	50.7
7. Maint. of Panchayat Plantation	20.3	25.3	33.8	33.8	42.1	155.3	244.7	253.1	653.1
8. Forest Demarcation					0.1	0.1	1.3	2.4	3.8
9. Maintenance of Trial Plots	0.5	0.5	0.6	0.7	0.9	3.2	12.1	27.1	42.4
10. Maint. of National Plantation									
11. Maint. of Panchayat Prot. Forest									
12. Implementation of Management Plan					25.0	25.0	200.0	250.0	475.0
13. Demonstration Saw Mill	6.0	6.0	6.0	6.0	6.0	30.0	30.0	30.0	90.0
14. Publicity and Extension									
TOTAL	35.8	43.0	51.6	52.9	87.6	270.9	635.3	735.0	1,641.2

Attachment 12 Table 4-a

KULEKHANI CATCHMENT

Voluntary - Labor - Cost

'000 NRs.

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
Panchayat Protected Forest:[1/]							50.0	100.0	125.0	150.0	175.0	600.0	175.0	175.0	175.0	175.0	175.0	875.0	1475.0
A. Panchayat Forest	70.0	24.7	53.7	85.8	114.2	285.4	132.2	129.8	112.4	91.1	67.9	533.4	42.7	17.4	6.5	9.3	13.1	89.0	907.8
Fuelwood[2/]																			
a. Planting	2.0	5.3	10.7	15.2	19.3	52.5	20.8	18.8	15.5	12.2	8.2	75.5	4.2	-	-	-	-	4.2	132.2
b. Casualty/Planting	-	1.1	3.0	6.0	8.6	18.7	10.9	11.8	10.6	8.7	6.9	48.9	4.6	2.4	-	-	-	7.0	74.6
c. Weeding/Hoeing	5.0	18.3	40.0	64.6	86.3	214.2	100.5	99.2	85.9	69.2	50.9	405.7	30.9	10.4	-	-	-	41.3	661.2
d. Watcher													0.3	1.1	2.7	5.0	7.9	17.0	17.0
e. Thinning									0.4	1.0	1.9	3.3	2.7	3.5	3.8	4.3	5.2	19.5	20.8
Panchayat Forest Fodder[3/]	2.3	8.1	17.6	28.1	37.3	93.4	43.1	42.4	36.5	29.4	21.5	172.9	13.3	5.3	2.7	5.0	7.9	34.2	300.5
a. Planting	0.7	1.7	3.5	5.0	6.3	17.2	6.8	6.2	5.1	4.0	2.7	24.8	1.4	-	-	-	-	1.4	43.4
b. Casualty/Planting	-	0.4	1.0	2.0	2.8	6.2	3.5	3.8	3.4	2.8	2.2	15.7	1.5	0.8	-	-	-	2.3	24.2
c. Weeding/Hoeing	1.6	6.0	13.1	21.1	28.2	70.0	32.8	32.4	28.0	22.6	16.6	132.4	10.1	3.4	-	-	-	13.5	215.9
d. Watcher													0.3	1.1	2.7	5.0	7.9	17.0	17.0
TOTAL COST	9.3	32.8	71.3	113.9	151.5	378.8	225.3	272.2	273.9	270.5	264.4	1306.3	231.0	197.7	184.2	189.3	196.0	998.2	2683.3

1/ See Appendix 11, Table 7.

2/ See Appendix 11, Tables 2a and 6.

3/ See Appendix 11, Table 2b.

Attachment 12 Table 4-b

DARAUNDI - CATCHMENT

Voluntary - Labor - Cost
'000 NRs.

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
Panchayat Protected Forest 1/							73.8	141.5	241.5	341.5	416.5	1214.8	516.5	616.5	716.5	716.5	716.5	3282.5	4497.3
A. Panchayat Forest Fuelwood 2/	4.6	21.6	53.8	96.8	138.1	314.9	184.6	236.4	288.2	363.6	414.8	1487.6	415.3	378.5	279.4	199.0	66.8	1379.0	3181.5
a. Planting	1.3	5.0	11.0	18.0	23.6	58.9	32.0	39.5	47.6	61.8	263.8	244.7	61.8	52.4	43.0	15.7	-	172.9	476.5
b. Casualty/Planting	-	0.8	2.8	6.2	10.2	20.0	13.3	18.0	22.3	26.9	34.9	115.4	36.0	34.9	29.6	24.3	8.8	133.6	269.0
c. Weeding/Hoeing	3.3	15.8	40.0	72.6	104.3	236.0	139.3	178.9	218.1	274.0	314.4	1124.7	314.4	286.1	238.9	146.8	39.2	1025.4	2386.1
d. Watcher													0.2	1.0	2.1	4.8	8.4	16.5	16.5
e. Thinning									0.2	0.9	1.7	2.8	2.9	4.1	5.8	7.4	10.4	30.6	33.4
Panchayat Forest Fodder 3/	1.5	7.0	17.6	31.6	45.0	102.7	60.2	77.1	93.9	118.3	134.7	484.2	134.4	122.5	102.6	63.0	20.5	443.0	1029.9
a. Planting	0.4	1.6	3.6	5.9	7.7	19.2	10.5	12.9	15.6	20.2	20.9	80.1	20.2	17.2	14.1	5.1	-	56.6	155.9
b. Casualty/Planting	-	0.2	0.9	2.0	3.3	6.4	4.3	5.9	7.2	8.7	11.3	37.4	11.7	11.3	9.6	7.9	2.9	43.4	87.2
c. Weeding/Hoeing	1.1	5.2	13.1	23.7	34.0	77.1	45.4	58.3	71.1	89.4	102.5	366.7	102.5	93.8	77.9	47.9	12.8	334.9	778.7
d. Watcher														0.2	1.0	2.1	4.8	8.1	8.1
TOTAL COST	6.1	28.6	71.4	128.4	183.1	417.6	318.6	455.0	1078.6	823.4	966.0	3186.6	1066.2	1117.5	1098.5	978.5	803.8	5104.5	8708.7

1/ See Appendix 11, Table 7.

2/ See Appendix 11, Table 2a and 6.

3/ See Appendix 11, Table 2b.

Attachment 12 Table 4-c

MYAGDI CATCHMENT

Voluntary - Labor - Cost
'000 NRs.

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
Panchayat Protected Forest 1/							60.0	107.2	138.6	198.6	258.6	763.0	318.0	376.6	378.6	378.6	378.6	1833.0	2546.0
A. Panchayat Forest Fuelwood 2/	-	11.2	36.4	61.1	132.3	241.0	123.6	166.8	215.8	261.8	275.6	1043.6	264.0	227.1	192.5	157.9	88.3	929.8	2214.4
a. Planting	-	3.2	7.6	10.8	15.2	36.8	22.0	28.4	36.8	42.4	41.2	170.8	38.8	30.0	27.2	19.2	5.6	120.8	328.4
b. Casualty/Planting	-	-	1.8	4.3	6.1	12.2	8.6	12.4	16.0	20.8	24.0	81.8	23.3	21.9	17.0	15.4	10.8	88.4	182.4
c. Weeding/Hoeing	-	8.0	27.0	46.0	111.0	192.0	93.0	126.0	163.0	198.0	209.0	789.0	200.0	172.0	143.0	116.0	62.0	693.0	1674.0
d. Watcher	-													0.5	1.6	3.2	5.5	10.8	10.8
e. Thinning	-									0.6	1.4	2.0	1.9	2.7	3.7	4.1	4.4	16.8	18.8
Panchayat Forest Fodder 3/	-	3.6	11.9	19.9	43.2	78.6	40.3	54.4	70.4	85.1	89.3	339.5	85.4	73.5	62.6	52.3	31.0	304.8	722.9
a. Planting		1.0	2.5	3.5	5.0	12.0	7.2	9.3	12.1	13.9	13.5	56.0	12.7	9.8	8.9	6.3	1.8	39.5	107.5
b. Casualty/Planting		-	0.6	1.4	2.0	4.0	2.8	4.0	5.2	6.7	7.7	26.4	7.5	7.1	5.5	5.0	3.5	28.6	59.0
c. Weeding/Hoeing		2.6	8.8	15.0	36.2	62.6	20.3	41.1	53.1	64.5	68.1	257.1	65.2	56.1	46.6	37.8	20.2	225.9	545.6
d. Watcher														0.5	1.6	3.2	5.5	10.8	10.8
TOTAL COST		24.8	48.3	81.0	175.5	319.6	233.9	328.4	424.8	545.5	623.5	2146.1	668.0	679.2	633.7	588.8	497.9	3067.6	5533.3

1/ See Appendix 11, Table 7.

2/ See Appendix 11, Table 2a and 6.

3/ See Appendix 11, Table 2b.

MUSTANG CATCHMENT

Voluntary - Labor - Cost
'000 NRs.

Attachment 12 Table 4-d

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
Panchayat Protected Forest 1/							45.0	90.0	135.0	169.7	214.7	654.4	259.7	304.7	349.7	349.7	349.7	1613.5	2267.9
A. Panchayat Forest Fuelwood 2/	5.3	17.2	37.3	71.3	111.6	242.7	134.2	146.2	161.0	172.7	186.7	800.8	198.6	191.7	159.2	142.5	137.8	829.6	1873.3
a. Planting	1.5	3.6	7.5	13.8	19.6	46.2	21.0	23.4	25.5	27.0	29.7	126.6	30.6	27.6	20.4	21.0	18.0	117.6	290.4
b. Casualty/Planting		0.8	2.0	4.2	7.8	14.8	11.2	11.8	13.2	14.4	15.2	65.8	16.7	17.2	15.5	11.5	11.8	72.7	153.3
c. Weeding/Hoeing	3.8	12.8	27.8	53.3	84.0	181.7	102.0	111.0	122.3	131.3	141.8	608.4	150.8	145.5	120.0	103.5	97.5	617.3	1407.4
d. Watcher													0.2	0.8	1.9	4.0	6.9	13.8	13.8
e. Thinning													0.3	0.6	1.4	2.5	3.6	8.4	8.4
Panchayat Forest Fodder 3/	1.7	5.7	12.3	20.6	31.7	72.0	41.1	47.6	52.5	56.4	61.0	258.8	64.8	62.9	52.9	48.1	48.0	276.7	607.5
a. Planting	0.5	1.2	2.5	4.0	5.6	13.8	6.9	7.6	8.3	8.8	9.7	41.3	10.0	9.0	6.7	6.9	5.9	38.5	93.6
b. Casualty/Planting		0.3	0.7	1.4	2.3	4.7	3.1	3.9	4.3	4.7	5.0	21.0	5.4	5.6	5.1	3.7	3.9	23.7	49.4
c. Weeding/Hoeing	1.2	4.2	9.1	15.2	23.8	53.5	31.1	36.3	39.9	42.9	46.3	196.5	49.2	47.5	39.2	33.8	31.9	201.6	451.6
d. Watcher													0.2	0.8	1.9	3.7	6.3	12.9	12.9
TOTAL COST	7.0	22.9	49.6	91.9	143.3	314.7	220.3	284.0	348.5	398.8	462.4	1714.0	523.1	559.3	561.8	540.3	535.5	2720.0	4748.7

1/ See Appendix 11, Table 7.

2/ See Appendix 11, Table 2a, and 6.

3/ See Appendix 11, Table 2b.

KULEKHANI CATCHMENT
Staff Cost
'000 NRs.

Attachment 13 Table 2-a

A. New Staff:

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
A. New Staff:																			
Attached Officer	19.9	20.1	20.3	20.5	20.7	101.5	20.9	21.1	21.3	21.5	21.7	106.5	21.9	21.9	21.9	21.9	21.9	109.5	317.5
Ranger	33.1	44.8	45.5	46.1	46.7	216.2	47.4	48.0	48.6	49.3	49.9	243.2	25.3	12.6	12.6	12.6	12.6	75.7	535.1
Forester	44.2	66.3	68.2	80.7	98.1	357.5	94.7	126.0	128.8	130.2	131.7	611.4	-	-	-	-	-	-	968.9
Forest Guard	19.2	29.3	29.7	35.1	35.5	148.8	57.6	65.6	47.5	48.1	49.2	268.0	-	-	-	-	-	-	416.8
Nurseryman	9.0	9.2	9.4	9.4	9.6	46.6	9.8	9.8	10.0	10.2	10.2	50.0	5.2	5.3	5.3	5.4	5.5	26.7	123.3
Senior Clerk	12.9	13.0	13.2	13.3	13.4	65.8	13.5	13.7	13.8	13.9	14.1	69.0	14.2	14.2	14.2	14.2	14.2	71.0	205.8
Driver	6.3	6.4	6.5	6.5	6.6	32.3	6.7	6.7	6.8	6.9	6.9	34.0	7.0	7.0	7.0	7.0	7.0	35.0	101.3
Peon	12.2	12.2	12.3	12.3	12.4	61.4	12.4	12.4	12.5	12.5	12.6	62.4	12.6	12.6	12.7	12.7	12.8	63.4	187.2
TOTAL	156.8	201.3	205.1	223.9	243.0	1030.1	263.0	303.3	289.3	292.6	296.3	1444.5	86.2	73.6	73.7	73.8	74.0	381.3	2855.9
B. Allowances for Existing Staff per Year:																			
D.F.O.	10.8																		
Ranger (1)	4.4																		
Forester (5)	22.2																		
Forest Guard	20.8																		
Mukhia (II) (I)	1.1																		
TOTAL	59.3																		

For details see Appendix 14, Table 1a, and Appendix 13, Table 1.

Attachment 13 Table 2-b

DARAUNDI CATCHMENT
Staff Cost
'000 NRs.

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
A. New Staff:																			
Attached Officer	24.6	24.8	25.0	25.2	25.4	125.0	25.6	25.8	26.0	26.2	26.4	130.0	26.6	26.6	26.6	26.6	26.6	133.0	388.0
Ranger	77.3	91.3	105.6	120.2	121.6	516.0	123.1	124.5	125.9	127.3	128.8	629.6	130.2	130.2	130.2	130.2	130.2	651.0	1796.6
Forester	128.8	156.5	184.8	267.1	270.3	1007.5	328.2	332.0	335.8	339.6	343.4	1679.0	405.0	405.0	405.0	405.0	405.0	2025.0	4711.5
Forest Guard	55.9	67.9	80.1	115.8	117.1	436.8	142.1	143.7	145.3	146.9	148.5	726.5	175.1	175.1	175.1	175.1	175.1	875.5	2039.8
Nurseryman	26.6	27.0	27.3	27.6	28.0	136.6	28.3	28.6	29.0	29.3	29.6	144.8	29.9	30.3	30.6	30.9	31.3	153.0	434.3
Senior Clerk	15.7	15.8	16.0	16.1	16.2	79.8	16.4	16.5	16.6	16.8	16.9	83.2	17.0	17.0	17.0	17.0	17.0	85.0	248.0
Driver	7.7	7.7	7.8	7.9	7.9	39.0	8.0	8.1	8.1	8.2	8.3	40.7	8.3	8.3	8.3	8.3	8.3	41.5	121.2
Peon	15.0	15.0	15.1	15.1	15.1	75.3	15.2	15.2	15.3	15.3	15.3	76.3	15.4	15.5	15.5	15.5	15.6	77.5	229.1
TOTAL	351.6	406.0	461.7	595.0	601.6	2415.9	686.9	694.4	702.0	709.6	717.2	3510.1	807.5	808.0	808.3	803.6	809.1	4041.5	9967.5
B. Allowances for Existing Staff per Year:																			
D.F.O	12.6																		
Ranger	4.4																		
Forester	22.4																		
Forest Guard	20.8																		
Mukhia	1.1																		
TOTAL	61.3																		

For details see Appendix 14, Table 1b. and Appendix 13, Table 1.

Attachment 13 Table 2-c

MYAGDI CATCHMENT

Staff Cost

'000 NRs.

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
A. New Staff:																			
Attached Officer	29.8	30.0	30.2	30.4	30.6	151.0	30.8	31.0	31.2	31.4	31.6	156.0	31.8	31.8	31.8	31.8	31.8	159.0	466.0
Ranger	89.9	105.9	133.7	151.8	153.3	634.5	154.7	156.1	157.5	159.0	160.4	787.7	161.8	161.8	161.8	161.8	161.8	809.0	2231.
Forester	149.7	181.5	214.0	308.9	312.1	1166.2	315.2	318.4	321.6	389.7	393.5	1738.4	397.3	397.3	397.3	463.5	463.5	2118.9	5023.5
Forest Guard	64.8	78.6	92.6	133.6	134.9	504.5	136.2	137.5	138.8	168.2	169.8	750.5	171.4	171.4	171.4	199.9	199.9	914.0	2169.0
Nurseryman	32.0	32.3	32.6	33.0	33.3	163.2	33.6	33.9	34.3	34.6	34.9	171.3	35.3	35.6	35.9	36.3	36.3	179.7	514.2
Senior Clerk	18.7	18.9	19.0	19.1	19.3	95.0	19.4	19.5	19.7	19.8	19.9	98.3	20.1	20.1	20.1	20.1	20.1	100.5	293.8
Peon/SAIS	26.9	26.9	27.0	27.0	27.1	134.9	27.2	27.2	27.3	27.3	27.4	136.4	27.4	27.5	27.6	27.6	27.7	137.8	409.1
TOTAL	411.7	474.1	549.1	703.8	710.6	2849.3	717.1	723.6	730.4	830.0	837.5	3838.6	845.1	845.5	845.9	941.0	941.4	4418.9	11106.8
B. Allowances for Existing Staff per Year:																			
D.F.O.	14.4																		
Ranger (2)	8.9																		
Forester (10)	44.5																		
Forest Guard (22)	41.6																		
Mukhia (2)	2.2																		
TOTAL	111.6																		

For details see Appendix 14, Table 1c., and Appendix 13, Table 1.

Appendix 13 Table 2-d

MUSTANG CATCHMENT
Staff Cost
'000 Rs.

Particulars	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	TOTAL	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	TOTAL	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	TOTAL	GRAND TOTAL
A. New Staff:																			
Attached Officer	33.6	33.8	34.0	34.2	34.4	170.0	34.6	34.8	35.0	35.2	35.4	175.0	35.6	35.6	35.6	35.6	35.6	178.0	523.0
Ranger	48.8	65.7	66.3	67.0	67.6	315.4	68.2	68.9	69.5	70.1	88.5	365.2	89.3	89.3	89.3	89.3	89.3	446.5	1127.1
Forester	65.1	98.5	116.1	133.9	152.1	565.7	153.5	172.2	173.7	175.3	212.3	887.0	214.2	214.2	249.9	249.9	249.9	1178.1	2630.8
Forest Guard	28.1	42.6	50.1	57.8	65.7	244.3	66.3	74.3	74.9	75.6	91.5	382.6	92.3	92.3	107.7	107.7	107.7	507.7	1134.6
Nurseryman	13.6	20.5	20.7	20.9	21.1	96.8	21.3	21.5	21.7	21.9	36.8	123.2	37.1	37.1	37.1	37.1	37.1	185.5	405.5
Senior Clerk	21.1	21.2	21.4	21.5	21.6	106.8	21.8	21.9	22.0	22.2	22.3	110.2	22.4	22.4	22.4	22.4	22.4	112.0	329.0
Peon/SAIS	34.0	34.1	34.1	34.2	34.2	170.6	34.3	34.4	34.4	34.5	34.5	172.1	34.6	34.7	34.7	34.8	34.8	173.6	516.3
TOTAL	244.3	316.4	342.7	369.5	396.7	1669.6	400.0	428.0	431.2	434.8	521.3	2215.3	525.5	525.6	576.7	576.8	576.8	2781.4	6666.3
B. Allowances for Existing Staff per Year:																			
D.F.O.	-																		
Ranger (2)	8.9																		
Forester (10)	44.5																		
Forest Guard (22)	41.6																		
Mukhia (2)	2.2																		
TOTAL	97.2																		

For details see Appendix 14, Table 1d., and Appendix 13, Table 1.

KULEKHANI CATCHMENT

Phasing of Staff

Attachment 14 Table 1-a

	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	Yr. 11	Yr. 12	Yr. 13	Yr. 14	Yr. 15
A. Project Office:															
Attached Officer (TG III)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ranger (TGN I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Senior Clerk (A NG I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Driver	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peon	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
C. Nurseryman	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B. Demarcation:															
Ranger (TNG I)	1	2	2	2	2	2	2	2	2	2					
Forester (TNG I)	2	4	4	4	4	5	6	6	6	6					
Forest Guard (TNG IV)	2	4	4	4	4	5	6	6	6	6					
C. National Plantation:															
Ranger (TNG I)	1	1	1	1	1	1	1	1	1	1					
Forester (TNG I)	2	2	2	3	3	3	3	3	3	3					
Forest Guard (TNG IV)	2	2	2	3	3	3	3	3	3	3					
Nurseryman (TNG IV)	1	1	1	1	1	1	1	1	1	1					

Summary of Staff:

Attached Officer	- 1	Senior Clerk	- 1
Ranger	- 4	Driver	- 1
Forester	- 9	Nurseryman	- 2
Forest Guard	- 9	Peon	- 2

Attachment 14 Table 1-b

DARAUNDI CATCHMENT

Phasing of Staff

(Cumulative)

	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	Yr. 11	Yr. 12	Yr. 13	Yr. 14	Yr. 15
A. Project Office:															
Attached Officer (TG III)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ranger (TNG I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Senior Clerk (A NG I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peon	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Driver	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C. Nurseryman	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B. Demarcation:															
Ranger (TNG I)	1	2	3	4	4	4	4	4	4	4	4	4	4	4	4
Forester (TNG I)	2	4	6	8	8	12	12	12	12	12	16	16	16	16	16
Forest Guard (TNG IV)	2	4	6	8	8	12	12	12	12	12	16	16	16	16	16
C. National Plantation:															
Ranger (TNG I)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Forester (TNG I)	8	8	8	12	12	12	12	12	12	12	12	12	12	12	12
Forest Guard (TNG IV)	8	8	8	12	12	12	12	12	12	12	12	12	12	12	12
Nurseryman	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Summary of Staff:

Attached Officer	- 1
Ranger	- 9
Forester	- 28
Forest Guard	- 28
Senior Clerk	- 1
Nurseryman	- 5
Peon	- 2
Driver	- 1

MYAGDI CATCHMENT

Phasing of Staff
(Cumulative)

Attachment 14 Table 1-c

	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	Yr. 11	Yr. 12	Yr. 13	Yr. 14	Yr. 15
A. Project Office:															
Attached Officer (TG III)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ranger (TNG I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Senior Clerk (A NG I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peon/SAIS	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Nurseryman (Central Nursery)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B. Demarcation:															
Ranger (TNG)	1	2	3	4	4	4	4	4	4	4	4	4	4	4	4
Forester (TNG I)	2	4	6	8	8	8	8	8	12	12	12	12	12	16	16
Forest Guard (TNG IV)	2	4	6	8	8	8	8	8	12	12	12	12	12	16	16
C. National Plantation:															
Ranger (TNG I)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Forester (TNG I)	8	8	8	12	12	12	12	12	12	12	12	12	12	12	12
Forest Guard (TNG IV)	8	8	8	12	12	12	12	12	12	12	12	12	12	12	12
Nurseryman (TNG IV)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Summary of Staff:

Attached Officer	- 1	Forester	- 28
Senior Clerk	- 1	Forest Guard	- 28
Peon/SAIS	- 3	Nurseryman	- 5
Ranger	- 9		

Attachment 14 Table 1-d

MUSTANG CATCHMENT

Phasing of Staff
(Cumulative)

	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	Yr. 11	Yr. 12	Yr. 13	Yr. 14	Yr. 15
A. Project Office:															
Attached Officer (TG III)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ranger (TNG)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Senior Clerk (TNG I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peon/SAIS	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Nureseryman	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B. Demarcation:															
Ranger (TNG I)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Forester (TNG I)	2	2	3	3	3	3	4	4	4	4	4	4	4	4	4
Forest Guard (TNG IV)	2	2	3	3	3	3	4	4	4	4	4	4	4	4	4
C. National Plantation:															
Ranger ITNG I)	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3
Forester (TNG I)	2	4	4	5	6	6	6	6	6	8	8	8	10	10	10
Forest Guard (TNG IV)	2	4	4	5	6	6	6	6	6	8	8	8	10	10	10
Nurseryman (TNG IV)	1	2	2	2	2	2	2	2	2	4	4	4	4	4	4

Summary of Staff:

Attached Officer	- 1	Senior Clerk	- 1
Ranger	- 5	Nurseryman	- 5
Forester	- 14	Peon/SAIS	- 3
Forest Guard	- 14		

The above yield is expected to be obtained at the following point of time:

(1) Lower region:

Age	Expected Dic. (cm.)	No. of Trees/ha.	Yield/ha. (m^3)
0	0	2500	0
8	8	1250	14
14	15	625	36
20	25	450	68
26	30	324	82
32	33	233	72
40	37	170	66
50	40	170	262

(2) Upper region:

0	0	2500	0
11	8	1250	14
18	15	625	36
25	25	450	68
33	30	324	82
43	33	233	72
55	37	170	66
70	40	170	262

The trees having less than 30 cm. dia. are considered as fuel trees and those with 30 cm. and above dia. will be considered as timber trees. The average percentage of timber in timber-sized trees will be taken as 60 percent for the lower region and 75 percent for the upper region. The rest will be counted as fuelwood.

PRODUCTION

I. Fodder

A. Fodder from Panchayat Forest (Fodder Plantation)

Fodder trees per ha. 816

Survived trees per ha. 816 x .85 = 694 trees.

1. Production of fodder for lower region:
   a. From 6th to 9th yr. = 694 x 25 kg
      = 17.35 tons green matter/ha/yr.
   b. From 10th year and after = 694 x 50 kg.
      = 34.7 tons green matter/ha/yr.
2. Production of fodder for upper region:
   a. From 9th to 14th yr. = 694 x 25 kg.
      = 17.35 tons green matter/ha/yr.
   b. From 15th and after = 694 x 50 kg.
      = 34.7 tons green matter/ha/yr.

B. Fodder from Extension (Community Planting)

Number of trees distributed 1000 seedlings (say)

Number of fodder trees = 500

Production trees 0.6 x 500 = 300 trees

1. Production from lower region:
   a. For 6-9 years = 300 x 25 kg = 7.5 tons green matter/year
   b. For 10th year and after = 300 x 50 kg. = 15 tons green matter/year.
2. Production from higher regions:
   a. For 9-14 years = 300 x 25 kg = 7.5 tons green matter/year.
   b. For 15th year and after = 300 x 50 kg = 15 tons green matter/year.

C. Forage from Plantations:

Forage yields from plantation area after main planting are:

1. For lower region 500 kg per ha. per year for 3 years.
2. For upper region 250 kg per ha. per year for 3 years.

II. Fuelwood, Poles and Timber

A. From Panchayat Forest (Fuelwood Plantation)

1. For lower region:

Age	Expected dia. (cm)	No. of trees	Thinning yield (tons per ha.)	Final Yield (tons per ha.)
0	-	2500	-	-
8	8	1250	10	-
14	15	625	25	-
20	25	625	-	60

2. For upper region:

Age	Expected dia. (cm)	No. of Trees	Thinning yield (tons per ha.)	Final Yield (tons per ha.)
0	-	2500	-	-
11	8	1250	10	-
18	15	625	25	-
25	25	625	-	60

Note 700 Kg = 1 m^3

B. From Extension (Community Planting)

Number of trees distributed = 1000 seedlings (say)

Number of fuelwood trees = 500

Production trees = 0.6 x 500 = 300 trees.

1. Production from lower region:

   Yield of fuelwood = 300 x 150 kg = 45 tons at the end of 20 years.

2. Production from upper region:

   Yield of fuelwood = 300 x 150 kg - 45 tons at the end of 25 years.

C. From Panchayat Protected Forest and National Forest

1. Production from Panchayat Protected Forest after management are as follows:

a. From lower region:

Area = 250 ha. (say)

Growing stock = 250 x 60 m^3 = 15,000 m^3.

Incremental average annual yield = 0.03 x 15, 000 m^3 = 450 m^3

From 4th year timber yield = 60% of 450 m^3 = 270 m^3

Fuelwood from branches, tops and cull trees = 2 x 270 = 540 m^3 = 378 tons.

b. From upper region:

Area = 250 ha (say)

Growing stock = 250 x 60 m^3 = 15,000 m^3

Incremental average annual yield = 0.02 x 15, 000 m^3 = 300 m^3

From 4th year timber yield = 75% of 300 m^3 = 225 m^3

Fuelwood from branches, tops and cull trees

= 1.75 x 225 m^3 = 393.75 m^3 = 276 tons.

Note: Yield is assumed as follows:

	Current Yield	Incremental Yield	Total Yield after Management
Lower region	2%	3%	5%
Upper region	2%	2%	4%

2. Production per ha. from National Forest:

a. From lower region:

Growing stock per ha. = 60 m^3

Incremental average annual yield = 0.03 x 60 = 1.8 m^3

From 4th year of management plan implementation

Timber yield = 60% of 1.8 m^3 = 1.08 m^3

Fuelwood from branches, tops and cull trees

= 2 x 1.08 m^3 = 2.16 m^3 = 1.51 tons.

b. From upper region:

Growing stock per ha. = 60 m^3

Incremental average annual yield = 0.02 x 60 - 1.2 m^3

From 4th year of management plan implementation

Timber yield = 75% of 1.2 m^3 = 0.90 m^3

Fuelwood from branches, tops and cull trees

= 1.75 x 0.90 m^3 = 1.58 m^3 - 1.11 tons.

D. <u>From National Plantation</u>

1. For lower region:

   Rotation age = 50 years.

   Expected average dia. = 40 cm.

   Yield = 12 m^3 per ha. per annum.

2. For upper region:

   Rotation age = 70 years.

   Expected average dia. = 40 cm.

   Yield = 9 m^3 per ha. per annum.

APPENDIX F

ENERGY AND RELATED ACTIVITIES

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Table of Contents

Introduction and Setting 1
RCUP Energy Activities 3
The Relation of Energy to RCUP 6
Energy Opportunities Within Project Areas 9
Biogas 11
Small Hydropower 16
Solar Heating/Drying 24
Charcoal 28
Stoves--Improved Design 29
Pyrolysis 30
Photovoltaics 30
Wind Power 31
Biomass 32
Improved Access by Roads and Bridges 33
Barriers To Implementing Solutions 33
Recommended Actions To Overcome Barriers 34
References 37
Tables
Proposed Energy Component Program for RCUP . . . 38
Proposed Energy Capital Cost for RCUP 41

Introduction and Setting

The major need for energy is to cook the food that fuels the human labor. This is generally done with firewood, except in places where firewood is already so scarce that animal dung must be used for fuel.

Other uses and sources of energy are minor or limited to only a few areas: the little bit of mustard oil that is burned for interior lighting; the indigenous water-powered grindstones that are found in some northern regions; flashlights; the petrol that is used in a few places to power rice, oil and flour mills, and kerosene to burn in lanterns or, to a much lesser degree, for cookstoves.

The history of the growing populations in the hill regions to supply themselves with simple sources of energy has contributed to a syndrome of environmental and economic deterioration that is national in scope. The most dramatic problem in this complex of problems is that of deforestation, which is due in large part to firewood demands and secondarily to gathering fodder for animals. Other causes of deforestation are the need to expand agricultural land and overgrazing, which are both aspects of energy needs as noted above. The erosion and upsets of the hydrological regime (downstream flooding, hillside springs and streams drying up) cause further losses to agriculture and the quality of life.

The substitution of dung for firewood as the forests recede is another pernicious aspect of this syndrome. Dung is the only locally available fertilizer to maintain fertility of agricultural land. Burning dung instead of applying it to the land speeds the nutrient exhaustion of the land and increases the pressure to farm on marginal and submarginal lands that are especially prone to erosion. Agricultural production is already declining at a rate of over one percent per year, while population growth proceeds at more than twice that rate.

Even if traditional fuels could be supplied in adequate quantities to meet the modest energy demands of hill populations, these fuels do not allow much improvement in the living standard of these communities.

Traditional energy arrangements do not allow for adequate lighting in the home, for space-heating or for plentiful hot water for bathing and washing. Simple lift techniques to raise water to villages or fields above a river are lacking. Possibilities for non-agricultural employment are limited. There is no respite offered for the labor required in gathering fuel and fodder or in hand-grinding flour, beating rice, etc.

Imported fuels are no answer; it is dangerous to build a dependency on such an uncertain supply, and it is no advantage to the hills to send scarce capital out of the area in exchange for addiction to a non-renewable energy source.

Given this scenario, the energy component of The Resource Conservation and Utilization Project is easily identified. The goal of the RCUP is to halt environmental deterioration and to improve the quality of life in the hills in the short and long term, by improving natural resource utilization practices and introducing new ways of utilizing previously unharnessed indigenous resources. Applying these goals to the area of energy, the RCUP will:

1. Provide firewood and fodder at points convenient to homes (community wood lots, roadside plantings of fodder trees);
2. Improve efficiency of fuelwood use (developing charcoaling, extension to encourage use of throughly dried wood, improved stove designs);
3. Improve transportation facilities as a means of (a) improving the economy by exporting surplus agricultural and other products; (b) improving access for innovations; and (c) saving labor time and energy;
4. Improve the diet using agricultural innovations;
5. Introduce alternative energy sources and technologies as appropriate (e.g., hydropower, wind, solar, biogas).

Consistent with the philosophy of the RCU Project, RCU energy related activities will be accomplished through existing Nepalese government agencies. Furthermore, as there is no ministry or department which focuses specifically on the subject of energy, energy projects in the RCU have been designed to enhance the various RCU Project Components (Watershed Management, Agronomy,

etc.) which do have clear relationships with certain agency missions. As these RCU Project Components are developed into action plans by the line agencies, energy activities will be incorporated into the action plan along with the activities to which they are related. These relationships are recognizable in the following list:

RCUP Energy Activities

1. Inventory and Monitoring. Absorption of streamflow and radiation data from The Watershed Management Measurement Program (see 2a, below); adaptive research in applications of micro hydropower for mechanical and electrical work, and applications of solar energy technology to communications electronics, water heating, space heating, and crop drying.

2. Watershed Management.

A. Data collection on streamflow regimes and stream sediment loads, wind patterns and windspeed, and solar radiation.

B. Research and pilot projects in the use of windmills for lifting water in irrigation schemes, in electrical generation, and for other potential uses.

C. Increasing agricultural production by terrace improvements.

D. Improving and protecting roads, trails, and bridges.

3. Forestry.

A. Various approaches to increasing fuelwood and fodder supplies.

B. Extension activities promoting use of dried wood for fuel, and improved stoves.

C. Research and development in sawmill design and establishment; in collaboration with the inventory and monitoring activity, explore possibilities for water-powered mills.

4. Irrigation. Investigate use of hydraulic ram and windmills to lift water to higher fields.

5. Agronomy.

A. Explore development of micro hydroelectric plant for production of nitrogen fertilizer.

B. Accelerate installation of biogas units to lower altitudes and explore development of biogas plants for cool climates.

6. Multipurpose Energy Development.

A. Construct a multipurpose impoundment that will store and deliver water for fisheries, micro-hydro generation, irrigation, and community water supply.

B. Install micro-hydro plants using "run-of-stream" sources for light industry and community/home use.

7. Training.

A. Introduce energy concepts and extension training for disseminating simple improvements in energy use, such as improved stoves in all levels of training, up to subprofessional levels.

B. Train professionals and administrators to perceive means for introducing alternative energy technologies or improving existing ones, in the context of their discipline or responsibility.

C. Through The Ministry of Forests Training Wing and The Institute of Renewable Natural Resources, provide training in specific energy technologies, such as biogas and charcoal.

8. Building Component.

A. Incorporate passive solar design into all buildings constructed for RCUP.

B. Provide solar-heated water in all RCUP buildings where it would be useful (excepting, of course, worksheds, greenhouses, etc.).

C. Use RCUP buildings as demonstration sites for (1) methods of low cost construction with improved energy efficiency and (2) alternative technologies including solar, wind, hydropower, improved stoves, and/or biogas, depending on each situation. As one example, the three small fruit and vegetable processsing plants planned should certainly be sited on a large stream so as to use hydropower in the machinery (electrical and mechanical), and should be provided with a large and efficient solar water heating system.

As noted above, no single HMG agency exists to address all possible energy options. RCUP can be a catalyst for guiding different agencies to address energy questions within their various fields, but RCUP is not in a position at this stage to reach all agencies. For instance, the weak RCUP

link with The Department of Roads limits the potential within the project for investigating the feasibility of hydropowered cableways at certain sites.

The possibility could be explored at some later time of making the services of The RCUP Energy Specialist Consultant available to the agencies so that they could begin to address energy considerations within their own programs.

The Relation of Energy to RCUP

The major energy requirements of Nepal's hill residents are: (1) food for the people to fuel the mechanical energy they apply to making a living; (2) feed for their draft and pack animals; (3) firewood or, in the absence of firewood, dung for cookfires; and (4) the exploitation of other indigenous energy sources.

To a lesser extent, firewood is also burned to warm the people who sit close to the fire (not for space heating), and to run a few small cottage industries.

These industries include blacksmithing and heating water for finishing of certain types of woolen blankets and carpets. In a few areas, water power is used to run grindstones. Lighting is generally by means of a homemade cotton wick floating in mustard oil.

Imported fuels and mechanical equipment are beginning to make some inroads in the hill areas. There are occasional petrol-powered floam and oil mills, and kerosene lamps and flashlights are found in all major villages. By far the largest quantity of the energy needs of hill people must still be supplied from their local resources.

Traditional sources of energy (firewood, animal dung and agricultural products) account for 94 percent of energy consumption in Nepal. However, by 1990 traditional energy should decline to about 90 percent of Nepal's total energy requirements, and commerical energy will account for 10 percent.

Traditional fuels, although they have the advantage of being domestically produced and not a foreign exchange drain, have low caloric value, low end-use efficiency and contribute to depleting forest areas, which results in soil erosion, landslides and river siltation. In 1978-79 firewood represented approximately 92 percent of total traditional energy, amounting to about 7.3 million tons of wood, equaling an estimated caloric equivalent of 2.5 million tons of petroleum.

Some communities are now being forced to burn livestock fodder or animal dung for heating and cooking. While the quantities presently burned are small (150,000 tons of fodder and 100,000 tons of dried animal manure in 1974-75), the concern is that by 1985-95 this will rise to 8 million

tons annually, if the present rate of forest destruction continues. Farmyard manure is the main crop fertilizer.

Assuming an annual average dressing of 2 tons/ha of dry dung and a resultant yield of 300 kg/ha of grain, use of 8 million tons of dung for fuel would mean a loss of over one million tons of food grains. This is a critical issue in the mountains.

Improving stove design and drying wood before burning would greatly increase firewood efficiency. Until improved wood stoves are used widely, firewood consumption will probably increase at the same rate as population growth, 2.6 percent per annum. Improved stoves, however, are not an absolute solution to Nepal's energy problem, but only a possible short-term solution which will allow HMG/N time to develop renewable energy (hydropower) throughout the country. According to an IBRD report, firewood usage contributed to the destruction of 25 percent of Nepal's forests during the period of 1968-78.

Commercial energy sources consist of coal, petroleum fuels and hydroelectricity. Nepal's demand for coal increases at approximately five percent per annum, but coal consumption has remained fairly constant at about 65,000 metric tons from 1974 to 1980. This reflects the supply constraint of imported coal from India. Petroleum fuels represented about 65 percent of commercial energy consumption in 1977-78 and hydroelectricity accounted for 10 percent in this period. Per capita consumption of energy (traditional and commercial) is low in Nepal, equaling about 197 kg of oil equivalent in 1978-79.

Potential demand for energy cannot be met in the short term (1-10 years) from Nepal's existing or projected renewable energy resources. Lead time for feasibility studies, final design, and construction of medium-sized hydropower projects requires 8-10 years. Therefore, Nepal will continue to rely on firewood as a major source of fuel for the traditional sector and it will probably remain a net importer of electric power from India, as well as petroleum fuels, well into the 1990's.

Although petroleum fuels are generally available, rapidly increasing prices may determine that future importation of these fuels is financially prohibitive at Nepal's present volume of consumption.

Nepal should develop an energy policy that would impose conservation measures, explore least-cost energy alternatives, encourage development of renewable energy sources and introduce a national educational campaign which would clearly explain the serious risk inherent in massive depletion of forest areas. A final yet critical component is that the support and participation of the rural people is essential throughout this entire process so as to ensure successful implementation of a national energy policy.

A balance must be maintained between what people take from the land and what they give back to the land. If this is not done, the land becomes less useful and people become poorer. The problem of deforestation in Nepal is not simply one of fuelwood supply. Trees and small plants are essential in the hills for holding the soil, preventing erosion and landslides, retaining moisture, and maintaining favorable microclimatic conditions. (Anyone trekking who has stopped under the two trees at a resting site has observed this.) Trees also provide fodder, construction materials, fruit and nuts. Therefore, even if there were some solution to the problem of firewood shortage in the hills and mountains via some alternative energy technology, the larger problem of soil erosion would remain. The soil provides food for man and animals; if it does not, they must leave. Soil and water conservation are basic parts of the RCU Program. They are discussed in the papers by the team experts on Range Management, Watershed Management, Irrigation and Soil Conservation. Fortunately, the solution to the soil erosion problem, revegetation, will also provide an important part of the solution to the fuel problem. As more trees are planted and allowed to grow, more fuelwood becomes available again.

We may not expect that afforestation projects will provide all of the energy needed by hill and mountain people. One reason for this is the increasing population. Another is that much land has already been lost. Then again, trees need more than one or two years to mature to full productivity. Thus, a lag or gap in energy supply is inescapable.

For the next several years the goal of an energy program for the Nepal hills and mountains must be to help stop the loss of trees and, wherever possible, to assist in establishing new trees. As already suggested,

this goal is a critical part of soil and water conservation, which in turn link with improved practices in agriculture, horticulture, and animal husbandry. A collaborative effort between projects in each of these areas is just as important as the effort within each field.

An energy program for Nepal must address the following questions:

1. How can domestic cooking fuel requirements be met and firewood supplies be increased without increasing environmental degradation?
2. How can available energy resources in the middle hills be utilized to increase food production?
3. How can Nepal's hydro resources be harnessed and utilized efficiently and economically?
4. How can more energy resources be captured and directed to increasing agriculture production inputs, such as irrigation and fertilizer production?
5. How can electrical capacity be increased for industrial, urban and rural consumers?
6. How can rural domestic lighting needs be economically met?
7. What conservation programs are feasible?

Answers to these questions will be discussed more fully in a later section of this report. Meanwhile two important points deserve attention. First, there is no single, simple solution to the firewood problem; many different things must be done in parallel. Second, wood cannot be the energy base for any significant new commercial developments in the hills and mountains for the foreseeable future. It can, of course, continue to meet construction needs and serve as the material for cottage industries; tools, carvings, boxes, and furniture. These have a relatively long useful life and represent the highest form of use of a valuable resource.

Energy Opportunities Within Project Areas

Nepal's greatest resource is its climate. Although the monsoon's torrential rains falling on steep hillslopes cause terrific erosion problems, Nepal's climate also provides the potential for developing a number of energy alternatives. As far as we know, energy sources in the

ground (petroleum, coal) are mostly absent from Nepal. Therefore, future energy plans must be based on sources above the ground (biomass hydropower, wind) and on imports. The type of energy developed will vary from place to place. For example the dry desert of Mustang has a high wind-power generation potential but does not lend itself to extensive forest development as do the more temperate areas.

Where new and alternative energy sources are recognized as desirable, as many different technical choices as possible should be offered for consideration. The reason for suggesting this comes from prior experience with assistance programs. When a new installation is made largely by outside people using foreign skills and then turned over to the people, no sense of involvement and participation has been built up that equips the people to bear the responsibility of maintaining the new technological device. Further, unless special efforts have been made to train and provide extension personnel, there is little prospect that another village will be able to copy the sample technology for its own benefit. If a village can be offered more than one choice of a new energy source, both felt needs and available skills can be weighed against the requirements and benefits of each alternative.

Clearly some new and unfamiliar ideas, processes, and tools must be put to use if changes for the better are to be made. These can often be introduced one step at a time. For example, Pakhapani (MYAGDI) is installing a piped drinking water system. The village wants to build a high level irrigation canal from the KHO KHOLA to the vicinity of the school. The irrigation project could be designed to use both aquaducts and syphons in crossing the obstructing ravines. Though neither concept has been used around there before, the villagers' experience with pipe installation makes the principles easier for them to understand. If new irrigation projects were designed with future hydropower uses in mind, they could reap further benefits of multiple use of the water and construction efforts. In the present case, provision for a suitable drop of waterflow, to give the gravity head necessary for hydropower, is well within current village capabilities. Hydroelectricity then would be the final step along this chain of developments.

In the Daraundi Khola valley near Gorkha the RCUP Design Team observed fisher folk who make their living from the river. Those people were skilled at diverting the main channel flow. Any riverbank or flood control project on the Daraundi Khola would benefit from making use of the river people's knowledge and skill.

Bearing in mind this incremental approach to developing energy alternatives, we can turn to a discussion of the range of renewable energy options that are appropriate for AID support in Nepal. Indepth consideration is given to biogas, small hydropower potential, and solar heating and drying. A more cursory treatment is given to charcoal manufacture, more efficient stoves, pyrolysis, photovoltaic (solar cell) devices, and wind power. Guidance and general recommendations for follow-up action are included.

Biogas. Biogas is a combustible mixture of gases produced in the biological decomposition of organic matter. The combustible component of the mixture is methane (CH_4), the prime constituent of natural gas. Other major components are carbon dioxide, hydrogen sulphide, and water vapor.

Various types of organic matter can be used as the feedstock for the production process, but the most attractive ones for use in Nepal are animal manure (cow and buffalo primarily), human excreta, and agricultural waste (principally straw). Mixed with water, the feed material undergoes bacterial decomposition in an oxygen-depleted environment (anaerobic digestion). The standard homestead system includes the following elements: an input trough where the feedstock is mixed with water forming a slurry; a digestor pit which is usually a cement-lined well; a gas collector which is a metal drum that floats in the slurry in the pit; and an outflow port for the digested slurry.

A. Utility. The digested slurry is as valuable a product as the methane gas. Rich in nitrogen, it is an excellent fertilizer that can be placed directly on a field or mixed with straw, allowed to compost and dry, and the resultant cake added to the field at a later time. The fertilizer contains all of the nutrients of the original feedstock but in a more readily available form.

The biogas itself can be used for cooking, lighting, heating, and running stationary engines or even automobiles. Since the gas flow can be easily

controlled, the gas can be burned in highly efficient ways, yielding more usable heat than would be available if the feedstock (e.g., cow dung cake) were used directly as a fuel.

An excellent summary of the biogas process, especially of its applicability for Nepal, is contained in Fulford's report "Biogas in Nepal, The State of the Art" (4). This report should be used as a prime RCUP reference on the subject of biogas.

For a biogas system, fed with cow dung, the net effect is that:

1. The burned gas yields up to 20 percent more heat per unit of dung than if the dung were dried and burned directly; and
2. The residual slurry used as fertilizer yeilds 10 to 40 percent more available nutrients than if the dung were composted and spread on the field.

When compared to the traditional use of cow dung as <u>either</u> a fuel source <u>or</u> a fertilizer, there are obvious advantages to using a biogas system which produces <u>more of both</u>.

B. <u>Limitations</u>. In spite of its obvious advantages, the use of biogas in Nepal is limited primarily by four factors:

1. Lack of public awareness;
2. Lack of trained technicians;
3. High initial capital cost of digestors of existing design;
4. Limited gas production at low temperatures.

C. <u>Lack of Public Awareness</u>. A small biogas system was first built in Nepal 20 years ago and a few other units were constructed prior to 1974. A governmental program to install 250 units during 1975-76 was a small beginning to push the technology. A follow-on program, which is currently being assisted through a grant to the United Mission to Nepal, would build 1,000 more units in the five-year period 1977-82. These programs demonstrate the governmental interest in this technology but the program goal appears to be modest considering the utility of biogas in Nepal.

D. <u>Lack of Trained Technicians</u>. Although the construction and operation of a small biogas system is not overly complex and detailed information is available, the average potential user would need a certain amount of technical assistance and advice to size, locate, construct and operate his unit. The demand for such assistance has exceeded the supply

of trained personnel, a deficiency that is expected to be reduced with the training of 400 technicians as part of the five-year biogas development program mentioned above.

E. High Initial Capital Cost of Digestors of Existing Design. The typical digestor in use in the country costs about $4000,* incorporating a cement and brick digestor pit, a 16-guage steel gas collection drum (or hood), and hired labor. It appears that these units are over-engineered and, as a result, more costly than necessary.

Significant cost reduction could be achieved through the use of cheaper construction materials. Some functioning biogas units in the Kathmandu Valley work faultlessly with a galvanized sheet metal gas collection hood (20-26 gauge as compared to the heavier 16 guage). The Butwal Technical Institute is perfecting a ferro-cement hood that can be constructed in isolated villages, requiring only chicken wire and cement. Another hood construction approach that appears feasible is a plastic lining attached to a frame fabricated from bamboo. The pit can be constructed using rocks in place of bricks and less cement than in the standard units.

One estimate of the cost of a cheaper unit has been made. A system incorporating a sheet metal drum, a rock and cement pit, and the owner's own labor might cost only $200, a figure that would significantly increase the number of potential users of biogas.

Alternatively a plastic bag digestor is available from Taiwan. This one piece unit includes both the gas collector and the digestor in one volume, costing approximately $100. Although the digestion scheme probably varies slightly from that of the typical Nepali units, it would appear worthwhile to fieldtest some of these bag units in Nepal.

F. Limited Gas Production at Low Temperatures. The rate at which gas is produced in the biological process depends upon the temperature of the slurry. As the termperature decreases, the gas production is reduced. Kathmandu Valley, at an altitude of 1,500 meters, is marginally suitable for biogas generation. If units are sited in the sun, their performance is flawless; but, if they are shaded for part of the day, their efficiency is significantly reduced.

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*Costs given in this section are 1977 figures.

The current biogas systems would be suitable primarily for the Terai and hills and valleys lower than 1,500 meters. If biogas systems are to be of much use in the colder hill regions of Nepal, ways must be found to increase the temperature of the slurry so that sufficient gas production can be maintained.

Several schemes appear feasible for heating the slurry:

1. Place the digested sludge and other material in a moat around the perimeter of the digestor. The heat released by this compost pile might provide sufficient heat to the slurry to maintain gas production in areas colder than Kathmandu;
2. Cover the system with a small "greenhouse"--a plastic lining on a simple wooden frame;
3. Cover the system at night with a bamboo or thatch mat to prevent heat loss due to nocturnal radiation; and
4. Incorporate a solar water heater into the system. Either mix hot water with the daily portion of feedstock or, a more complicated system, pass hot water pipes through the slurry. The cost and sophistication of the use of a solar water heater would appear to limit this approach to application where hot water itself is desired, such as health posts, schools, etc.

G. The Chinese Design. As pointed out by Fulford (4), the Chinese have eveloped a different plant design that does not require a floating gas holder. The top of the plant is solid, of masonry or cement, made gas tight, and the pressure of the gas produced by the decomposition of the wastes forces the slurry through the outlet into a reservoir. As gas is used, the slurry flows back into the plant to replace it. One aspect of the OPG grant to United Mission for Nepal is to research various designs. The RCUP should encourage UMN to explore the Chinese design.

H. Recommendations. Because of the potential utility of biogas systems in countries at every stage of development (including the US), much current research is being directed towards increasing the range of applicability of the process, improving the acceptability of various feedstocks, designing low cost digestor systems, searching for preferred strains of digesting bacteria, etc. It is not appropriate that Nepal engage its limited

resources in this type of basic research. Rather Nepali activities should concentrate on necessary local adaptations to approaches proven feasible elsewhere. This will require that Nepali officials and other leaders keep abreast of the biogas activities in other countries.

Recognizing that the high cost of the standard system ($4000) will limit the application of biogas to the large farmers outside the AID target group, AID should concentrate its support on those activities that will bring the utility of biogas systems to the poor majority of Nepal. In particular AID might support:

1. Informational programs designed to increase the public awareness of biogas;
2. Subsidized plant construction at the homes of small farmers;
3. Construction of units at health posts, schools, and at the village residences of medical, teaching or technical extension personnel;
4. Expansion of the technical support capability of the technicians to be trained in the biogas program by introducing technical and extension personnel to the technology. This might take the form of a series of short seminars on the essentials of biogas that would permit personnel assigned to remote locations to perform an initial determination of the feasibility of biogas generation in the place of assignment;
5. Community digester schemes which would enable several small farmers to share the capital cost of the plant and introduce economics of scale in the construction of the digesters. The social organization problems inherent in a communal digester would need to be considered in great detail;
6. Community latrines that could support public health efforts and provide the means for the incorporation of human wastes into a community digestor. The Peace Corps has already begun some work in this area under funding from AID/W. However, using human excreta in a biogas digester is culturally unacceptalbe in Nepal. Nevertheless, this work could be greatly expanded in subsequent AID projects;

7. Investigation into cost reduction techniques. These would include experimental work using different materials for digesters and collectors, tests of the suitability of various feedstocks in addition to cow manure, and field tests of the experimental results; and
8. Investigations into means of maintaining a sufficiently high temperature for the slurry. This will require experimental work in Kathmandu and, more importantly, experimental field testing at higher altitudes.

Many of these recommendations are included in the Biogas Research Development/Construction Project (367-0139) supported through US AID Grant No. 498-0251, September 25, 1979.

Small Hydropower. Nepal is rich in hydropower potential. Its estimated value of 83,000 MW means that Nepal possesses, in theory, 2.3 percent of the world's total hydropower potential while the country has less than 0.1 percent of the total land surface and 0.3 percent of the world's population. Although all of this potential can and should not be exploited (for technical, economic and environmental reasons), the total usable potential remains a very valuable asset for Nepal's socioeconomic development.

AID should be particularly interested in the utilization of small (micro) hydropower units for rural and village development.

Throughout the mountain and hill regions of Nepal are found small water-powered mills for grinding wheat and other cereal grains. Locally built, using traditional skills and techniques that are also applied to local irrigation works, the mills are characterized by mill and tail race canals constructed of rock with wooden penstocks feeding a wooden vertical axis water wheel directly driving a grinding stone located in the mill house above it.

Both single and double mills are found. The single mill is housed in a low stone building about five feet in height and perhaps 10 feet by 12 feet in area. Double mills are housed in a similar but slightly larger

building, perhaps 12 feet square. Each mill has its own grinding stone assembly, water wheel, and penstock. The water wheel and tail race are underneath the mill house minimizing the necessary gearing. The stones are about two feet in diameter and perhaps three inches thick; the water wheels are about three feet in diameter with paddles roughly 10 by 15 inches. Frequently a series of three or more mill houses are stacked above each other on a hillside, all feeding from the same stream.

The mills are ingenious, workable, reliable, and capable of being maintained by local craftsmen. But they are not technically efficient users of the water power available.

A rough estimate was made of the power available to a single mill system by estimating the height of the penstock, the cross-sectional area of the water flowing in the penstock and the velocity of the water. This very approximate calculation yielded 2-3 kilowatts (3-4 horsepower) as the power input. At this particular mill, an excess of water was available which was diverted around the mill. No estimate was made of this unused power potential.

These estimates were made in late November, during the dry season in Nepal. Local informants reported that the stream flow is always at least as great as observed by the design team, and that the mills worked all year round except at the beginning of the spring planting season when water was diverted upstream for irrigation purposes.

Using these calculations, it appears that such sites possess easily 10 kilowatts of hydropower potential. These sites were located in remote and impoverished areas of Nepal (Jomsom, Gorkha and Jumla). It is estimated that numerous sites throughout the country possess 10-100 kilowatts of reliable hydropower that could be harnessed for mechanical or electrical work.

To obtain the full potential benefits of hydropower development at both large damsites and small hydro installations, problems of erosion, siltation and flooding must be dealt with. These problems are addressed by RCUP projects in reforestation, controlled grazing and watershed management, irrigation, and hydrology.

A. Available Systems. The Mechanical Division of the Balaju Yantra Shala (BYS) of the Nepal Industrial Development Corporation in Kathmandu manufactures cross-flow water turbines in 9 sizes for power ratings ranging from two to 45 kilowatts. The turbines can be used to produce mechanical power to drive various machines or can be connected to a generator to produce electrical power. The cost for the turbine alone ranges from $1,000 to $1,500 depending on size. (It is assumed that this is the cost in Kathmandu and does not include transportation costs to other places in Nepal.) A turbine installation, including a steel pipeline penstock, turbine, screens to protect the system from rocks and debris, control gates and power pullys, would cost about $2,000 for mechanical power only.

If electrical generation were required, the cost would increase. A system capable of 15 kilowatts of mechanical power (about 20 horsepower) might produce 5 kilowatts of electrical power at a cost of perhaps $10,000. The turbine and water system would be contructed at BYS, but the governor and electrical generator would be imported.

BYS offers technical assistance to potential users to determine the proper size and placement for hydropower installations. Their equipment is constructed in and for Nepal, emphasizing operational simplicity and transportability over the arduous trails of the country.

Alternatively, small hydroelectric systems are available in the US and elsewhere. A three kilowatt (eletrical power rating) system composed of a turbine, generator, DC to AC inverter and a battery bank costs $3900 to $4600 in the US. It does not include the steel penstock, control gates and screening of the Balaju unit.

B. Applicability of Hydropwer. The simplest way of employing the available hydropower is the direct use of the mechanical power generated by a turbine. BYS recommends the following machinery for Nepal:

--rice huller
--paper beater
--water pump
--power loom
--flour mill
--oil expeller
--saw mill

Such machines would be driven by simple belt transmissions or by direct coupling. Combinations of machines can be operated simultaneously or intermittently.

The generation of electrical power, although more complex and sophisticated and less efficient in its use of the available hydropower, opens a wide range of applications useful for the social and economic development of Nepal: lighting, operation of welding sets, electric motors, industrial heating, perhaps even cooking and space heating.

BYS has built and installed about twenty of its small turbine systems, including two units with electrical generation capacity.

An especially exciting application was the subject of a meeting in the Spring of 1977--the use of small hydroelectric units to produce fertilizer in Nepal (5). The meeting recommended a program of small scale hydropower development coupled with a program of afforestation.

For a typical hill village of 250 people, a 16-18 kilowatt hydropower plant and a 30-40 ha managed woodlot could provide significant irrigation, fertilizer, domestic water supply, lighting and small industry returns. Nitrogen fertilizer would be produced through the electric air process or electrolysis.

The meeting included a calculation of a village energy balance. The conclusion was that a 10 kilowatt turbo-generator unit with irrigation pumps and a fertilizer production unit would, at a total cost of $40,000:

1. Through irrigation, permit cultivation of winter wheat on 12 ha (producing 30 tons of wheat);
2. Produce 34 tons of wheat straw to be used as animal fodder;
3. Fertilize 30 ha of rice/maize fields and increase the yield by 30 tons;
4. Produce 57 additional tons of maize straw if maize were the monsoon crop cultivated over the entire 30 ha of the village fields.

The increases of fodder (wheat and maize straw) would eliminate the need to exploit the forests to feed animals or to expand cropped area. The increased food yield would amount to an annual benefit of $7000 in increased foodgrain availability.

Cooking and heating would be done by firewood and so a self-sustainable village woodlot would need to be treated. This would require 36 ha to be planted at a total investment of $22,000.

The net result of this village development scheme would be the elimination of the current exploitation of nearby forests that is contributing to the environmental deterioration of much of the hill region of Nepal.

The initial cost of a program such as this would be very high, about $250 per person. But the potential gain, increased food production and the reduction in environmental deterioration, warrant field testing of the approach.

In addition to the turbine hydropower systems discussed above, another water-powered device very applicable in Nepal is the hydraulic ram pump. This simple device can raise part of the water supplied to it to a much higher point than the initial water supply. Its simplicity and low maintenance requirements make it a very useful source for domestic water supply or irrigation in villages situated above rivers or streams.

BYS manufactures a basic unit that can pump one to four gallons per minute up to a maximum height of 300 feet. It costs about $50 not including the piping necessary. Units have been operating satisfactorily for more than 10 years. A larger ram is currently under development.

Additionally, the Peace Corps in Nepal has installed a number of hydraulic rams of American manufacture in Nepal.

C. Recommendations. Nepal's mountainous terrain poses great problems for economic development but, at the same time, provides a source of available power and energy that, if properly channelled, can be instrumental in development programs. However, the availability of hydropower does not necessarily mean that it should be utilized. No energy supply is cheap. The cost of harnessing an energy source and converting the energy into useful forms can be justified only if the resulting social and economic gains warrant the cost.

Each perspective application of hydropower will require a thorough examination of the existing social and economic organizations and the public health and welfare needs of the community.

It is recommended that, having considered the above, the RCUP support hydropower activities in the following areas:

1. Village Water Supply.

   Where existing water supplies are unsanitary or at a great distance, public health and welfare will be enhanced by RCUP drinking water projects bringing potable water to a village. The site would determine the preferred approach: gravity-fed systems, hydraulic ram, hydromechanical or hydroelectrical pumps, or wind-powered water pumps. The source must be protected (vegetative cover, fencing and structures) to ensure continuous supply of high quality water.

2. Electrification of Health Posts, Schools and Veterinary Posts.

   Realizing that there are many constraints to improved health care, animal husbandry, education, and community development that are more pressing than the lack of electrical power, the availability of such power can be useful in advancing development efforts in these areas. Production of electricity exclusively for such use probably would not be justified in most cases. (Regional hospital facilities would be an exception.) But where hydropower is feasible for other uses, excess capacity might profitably be used for this purpose.

3. Irrigation.

   Although gravity-fed irrigation is widely practiced, powered irrigation projects would permit more land to be cultivated and, more importantly, second cropping during the dry season. An example would be the winter wheat proposed in reference (5). Properly chosen, such projects would be economically justified. But social and economic uncertainties pervade Nepal. This condition would justify a limited number of experimental tests of powered irrigation for second cropping within the context of the RCUP irrigation program, to determine the social acceptability and economic effectiveness of the approach.

4. Flour Milling and Oil Expelling.

   The existing small flour mills are a workable feature of the social/economic life of rural Nepal. Any attempt to introduce

more efficient mills should minimize the displacement of the mill owners and operators by involving them in the operation of the new mill. A feasible approach is to replace an existing wooden mill with a more efficient turbine unit capable of meeting current milling needs and providing extra power for water pumps, electrical generation or oil presses. The existing water delivery system would be retained to the maximum extent possible. The integration of the new technology into the existing social framework would contribute to the project success by assuring that existing social elements will profit from the community acceptance of the idea.

5. Fertilizer Production.

The scheme proposed for village development, a hydroelectric fertilizer production unit, deserves experimental testing on the basis of its potential benefits to Nepal. Such tests should be conducted in several different locations, appropriately chosen to give information on the reliability of the process in the field and to determine the problems encountered in introducing an approach so modern into villages so traditional. These tests should be seen as needed experiments and need not be justified on a cost basis. Follow-on large scale implementation of the approach would require an economic analysis and cost justification based on the results of these experiments.

6. Cottage Industries and Small-Scale Industries Processing.

The government of Nepal and the international donors have frequently expressed their desires to strengthen cottage industries. Small-scale industry, although limited in Nepal, offers additional employment opportunities as alternatives to continued farming of marginal lands. Many of these industries will require powered devices. Industries proposed by various experts, both Nepali and foreign, that could utilize small hydropower units include: cotton and wool weaving (power looms); metal craft in bronze, Nepali papermaking, and lime production (electric furnaces as

an alternative to wood or charcoal); local saw mills, carpentry and wood-working centers; pottery manufacture (powered wheels and electric kilns); oil presses and grain mills; welding, metal repair and fabrication, and small tool manufacture.

To give a single example, a circular sawmill with an overshot wheel with perhaps 10 or 12 feet of head can produce about 30 net horsepower. It would seem that all available waterpower should operate a generator which in turn would power electrical motors in the sawmills.

The establishment of appropriate industries will require a thorough investigation of the organizational structure required and feasibility studies of the potential markets and economic benefits to be gained. To test the technical feasibility of using hydroelectricity as a substitute for the deleterious consumption of wood and charcoal, the RCUP might initiate efforts to replace wood-burning furnaces and kilns in existing small metal craft, lime or paper production facilities with appropriate electrically-heated devices. Such tests would provide useful data for subsequent activities by AID and other donors.

7. Powering Ropeway Transport Systems.

A severe constraint on the development of the hills of Nepal is the lack of an effective means to transport the goods produced there. For the most part, such goods are carried by men or small- or medium-sized animals (sheep, goats, some cows and burros) for days before they reach a town with a road connection to a larger market. A workable solution to this very difficult problem is to use cargo-carrying ropeways to provide the needed transport. In the mid-50's, AID financed such a ropeway to supply Kathmandu with goods from India and the Terai.

The development of effective markets for goods produced in the hills will require improvement in the transportation system of the region. Light ropeways powered by hydromechanical or hydroelectrical means could provide this needed improvement. Although

no specific recommendation for action is made here, subsequent analyses of the economic development potential of the hills should give consideration to this issue.

8. Illumination.

Lighting has not been a major issue in a society where indoor activities are mainly limited to cooking and sleeping. The cotton-wick-and-mustard-oil lamps and fireglow have generally been adequate to shed light on these activities. However, as more and more children go to school and need to study in the evening, intensive lighting is more of a felt need. As labor time and energy are saved by innovations such as drinking water projects, nearby fuelwood lots, and bridge and trail improvements, and as cottage industries are encouraged due in part to such labor savings, people will undoubtedly be inclined to engage in certain evening activities that require some illumination.

Hydropower, windpower, and biogas all offer opportunities to provide lighting in addition to being used for mechanical power or cooking fuel. Initially, it would be most efficient for lighting to be supplied to central locations--schools (for evening study halls), craft centers, meeting halls, and perhaps some street lighting. As alternative energy sources are expanded and the income of villagers has risen to the point that they can afford the equipment necessary to have home lighting, a rural electrification program can proceed.

Solar Heating/Drying. The terrain and the altitude features of Nepal result in micro-climatic areas with considerable variations in the amount of sunshine reaching the ground. In general, however, one can say that the potential for small-scale use of solar energy in Nepal is good. In particular, Nepal offers attractive opportunities for the use of solar water heaters and solar crop dryers. Architectural innovations would permit beneficial applications of solar energy for heating schools, administrative centers and medical posts in the hill regions of Nepal.

A. Solar Water Heaters. The Plumbing Division of Balaju Yantra Shala (BYS) manufactures a line of solar water heaters ranging in size from 60 liters

(about 15 gals.) to 200 liters (about 50 gals.). Several designs are available. Prices range from $80 to $480.

The systems are simple and rugged. Over 500 have been installed at many different locations throughout Nepal in schools, private homes and tourist facilities.

The systems are constructed of flat-plate collectors connected to a hot water storage tank. Window glass covers the collectors and glass wool is used as insulation throughout the system. Two types of collectors are made. In one, a grid of steel pipes welded together is snugly clamped to an aluminum sheet which conducts the sun's heat to the pipes and to the water in them. In the other, two steel sheets are fixed together in a quilted pattern. Although greater efficiency would be attained from using copper or aluminum systems, the use of steel pipes in the BYS water heaters is explained in terms of the greater reliability of steel welded joints.

The units work quite well. A standard 120-liter system with a 1.7 m^2 collector produces a maximum temperature of 60°C (140°F) during a November day. The heat storage capability is excellent. At 9:00 a.m. the temperature of the water was 40°C (104°F) illustrating the ability to store heat from the previous day.

The transport of the glass plates (190 cm x 88 cm) could pose a problem. Experimental work on the use of pl stic films to replace the glass plates should be conducted. New films are available that are especially resistant to deterioration from the ultraviolet component of sunlight. Such plastics might be very applicable for use in solar systems in the hill regions of Nepal.

The provision of solar hot water systems at village medical posts and schools would be appropriate for RCUP support. Some cottage industries would benefit from hot water availability. For example, hot water could be used to wash textiles woven from cotton or wool, to prepare dyes, and even to launder clothes, thus prolonging their life.

B. Solar Crop Dryers. Some work is underway at the Center for Applied Science and Technology and at other sites (e.g., Jumla's Horticulture Station) on the use of solar crop dryers to produce dried fruits and vegetables. The initial results have been promising but few real field tests have been conducted.

Nepal would benefit from an indigenous dried-food industry. HMG/N is interested in developing the horticultural potential of the hills and has reported that "production from fruit cultivation per unit area of land is quite a lot higher than that of cereal grain production. Mango, bananas, and papaya are reported to produce 30-40 metric tons per ha. Apples, pears, and mandarins are reported to produce 25-30 metric tons per ha. The national average for fruit production is about 6.5-7 metric tons per ha, whereas the cereal grains under an excellent cropping system and management will produce about 10-12 metric tons per ha. The national average is 3-3.5 per ha." (3)

About 26 research stations and farms in different development and ecological regions supply technical information and support new plantations. Horticulture is seen as a source of cash, a vehicle for regional integration, as an instrument to fight erosion, and as a way to create new employment opportunities (e.g., making jam, jelly, concentrate, juice, and dehydrated products).

One of the major difficulties is the perishable nature of the product. Transportation is difficult, storage facilities nonexistent or inadequate. One approach would be to dry the products. The dried fruit can be stored for later use or sale.

The RCUP will support expansions of the experimental work on solar drying of both fruits and vegetables and of efforts to dry seed for more effective storage. The use of low-cost plastic films should be thoroughly considered for such work. Field tests of appropriate units should be included in RCUP efforts to expand agricultural and horticultural production. The local manufacture of workable units, requiring local carpentry skills, wood and either glass plates or preferably plastic film, could provide employment opportunities.

C. Space Heating. As noted in the introduction, Nepalese hill dwellers take a very energy-efficient approach to keeping warm in winter: Rather than attempting to heat a whole house or even a room, a fire is used to warm the people who sit next to it. Even so, this use of firewood accounts for a substantial fraction of wood burned in the hills above 7,000 feet elevation. Innovative approaches to design and construction could introduce

space heating and reduce the amount of firewood burned for warmth by making use of the customarily good sunshine during the winter (dry) season to heat public buildings in the hills.

Tourist lodges are beginning to use solar energy for heating. In Dzarkot (4½-hour trek from Jomsom), the construction of a locally-owned lodge is currently nearing completion. This lodge features a simple solar space heating system designed by an American architect temporarily living in the area. The system uses glass plates to cover a blackened absorber surface. The heated air passes into the individual rooms of the lodge. Local materials are used extensively. The addition of the solar heating system increased the cost of the lodge by 15 percent. The government has been impressed by the system and has discussed the possibility of duplicating it in government buildings in Jumla.

Another example of official interest in the concept is the report prepared for the World Bank on the energy options for a proposed Bank-funded tourism project in the Khumbu region (6). The study indicated that solar heating of lodges appeared to be significantly cheaper than charcoal or kerosene systems.

The use of solar energy to heat buildings in the hills is in its infancy. RCUP will assist in the dissemination of this technology by incorporating it in buildings that will be constructed in its various projects. The solar approach would be especially appropriate for medical posts, schools (not to be built by RCUP, but RCUP could contribute to energy support of these facilities), rural residences of technicians, training centers, and buildings housing small industries. It would not appear appropriate for individual homes of the the villagers. Designs will build upon local experience--in particular, the Dzarkot example.

D. Recommendations. The utility, ease of operation, and low operation cost associated with solar heating and drying devices recommend their more extensive use in Nepal's development efforts. RCUP will:

1. Provide solar hot water systems on request at appropriate village medical posts and schools;
2. Include solar hot water systems for those RCUP-funded cottage industry efforts that require hot water;

3. Support field tests of solar fruit and vegetable dryers;
4. Incorporate solar drying into its agricultural and horticultural development efforts; and
5. Incorporate solar heating into the plans for public buildings that will be constructed with RCUP funds.

Charcoal. Charcoal is in limited use in Nepal. Although traditionally iron smelting consumed large quantities of this fuel, as wood became more scarce, this industry died out. Blacksmithy, using iron supplied by the customers, and metal craft in bronze, brass, and copper still require a certain amount of charcoal, but expense has made it difficult for these small industries to continue.

The FAO had some experience with large-scale charcoal production in the Terai. Although an initial feasibility study indicated that the charcoal could be produced there and sold in Kathmandu at a price significantly below the price for local poor-grade charcoal, the actual production and transportation costs were higher and the charcoal was not able to achieve much market penetration in Kathmandu. The kiln is currently not in service.

But the concept of local, small-scale production in the hills deserves consideration. Since charcoal is much lighter and less bulky than an equivalent amount of energy in the form of dry firewood (about 40 percent of the wood's weight and 60 percent of its volume), the possibility exists to manufacture charcoal in woods more distant than over-exploited local forests. This would reduce some of the pressure on these forests and enhance the natural generation capacity of the forests.

Additionally, a charcoal fire is a more efficient user of energy than a wood fire for cooking. Thus less energy would be needed to perform this basic task, reducing the pressure on the forests still more. This statement assures that the increase in efficiency is sufficiently great to compensate for the energy lost in converting the wood to charcoal. The FAO reference uses 70 percent as the conversion efficiency of the wood to charcoal process. This is a high figure that might be appropriate for a modern high-efficiency kiln. Simpler kilns would not be expected to attain this efficiency however (an estimate would be an efficiency of 30 to 40 percent for simple techniques).

When an open fire is used for cooking and for heating, it would not be appropriate to substitute charcoal for wood. But in those areas and during those times when heating is not a problem, replacing wood with charcoal could provide an energy-saving technique. Estimated energy efficiency of an open wood fire is very low. Values of 5 to 15 percent are often quoted, with the average being nearer the low end of the range.

The process of manufacturing charcoal could provide local employment opportunities in collecting fuel wood, operating the kilns, and distributing and marketing the finished charcoal.

The potential benefits of an increased use of charcoal in Nepal, in particular small-scale production in the hills, warrant a serious examination of its feasibility. A determination will be made of the extent of the use of open fires for cooking alone; the efficiency of this process; the efficiency, reliability and ease of maintenance of simple kilns using designs developed elsewhere; and appropriate cost considerations.

Stoves--Improved Design. The traditional Nepalese "chulo," a low stove built of rocks with a mud plastering, is an improvement over open fires in terms of efficiency of firewood use. Its efficiency can be increased still further with the additional advantage of eliminating eye and respiratory irritation of the smoke by the simple design modifications of the "smokeless chulo."

Fuel use efficiency of the smokeless chulo is reported to be about 45 percent. It is constructed primarily from local materials, except for a couple of pieces of sheet tin (cut from a kerosene or biscuit can) used to cover cook holes not in use and two- to three-foot lengths of four-inch diameter tin pipe for smoke egress. In the few places in which it has been introduced, it has proven culturally acceptable.

Some questions have been raised regarding impact of adaption of the smokeless chulo. O[illegible] the question as to whether sparks might exist along with the smoke, a danger to thatch roofs and haystacks. In the experience of one installer of these stoves, this has been no problem. In any case, this potential danger could be reduced by capping this pipe with a screen. Another potential problem that has been pointed out is that the benefits of curing certain foods in the smoky kitchens would be lost. However,

this technique is used only be certain castes in certain areas, and a more efficient method of smoking foods is to use a small smokehouse over a small, smoldering fire that is built expressly for the purpose of generating smoke. This technology should be offered concurrently with the smokeless chulo construction project if local people feel it to be an important issue.

Some investigators have expressed concern that trekkers and travelers on highly traveled routes are responsible for depletion of forests and wasting fuel in inefficient open fires in these areas. It would be worthwhile to explore this issue with the Panchayat-level conservation committee and to investigate the utility of providing chulos under small shelters at popular stopping places, perhaps even offering firewood for a nominal fee. One possible problem with this plan is that higher castes may refuse to use public chulos. Local advisors may be able to solve this potential difficulty.

Pyrolysis. Pyrolysis is the process of converting organic materials (e.g., wood chips, sawdust and agricultural wastes) to more convenient combustible materials (charcoal, oil and combustible gas) in a high-temperature, oxygen-depleted environment. The utility of pyrolysis in Nepal is probably limited to the manufacture of wood charcoal. The relative inefficiency of this process (about 70 percent for modern high efficiency methods) is due to the loss of the potential oil and gas products. However, charcoal still represents a more efficient use of firewood than burning the wood directly. AID might find suitable opportunities to incorporate more sophisticated pyrolytic conversion into some of its future development efforts in Nepal.

Photovoltaics (Solar Cells). Photovoltaic devices convert sunlight into electricity. Simple to use, rugged and reliable, they are ideally suited for many applications. An example, especially appropriate for RCUP, is an application where electricity is essential but the site is so remote that the difficulties or costs of conventional generation techniques are very great. When diesel generation is used, this might be caused by problems with the availability or cost of diesel fuel or maintenance difficulties. The general transportation situation of Nepal would make the country a prime candidate for extensive use of photovoltaic devices.

The cost of such devices are currently quite high ($15/watt), but the US Department of Energy has a program to reduce this cost to $0.50/watt by 1985. At this price the technology will be competitive with electricity from national grid systems such as in the US and elsewhere.

Even at today's high price, the use of photovoltaics is cost-effective for selected applications. An attractive one is to power communications systems. Radio tranceivers require 10 to 200 watts of power. This results in a power-system cost between $150 and $3000.

At least one site in Nepal already uses a solar cell power system, the Horticulture Station in Marpha. FAO has been installing solar cell units with radio communications. Other remote locations where radio communications are available (e.g., airports) use diesel generators, sometimes having a spare generator available for when the first breaks down. A Khumbu Region Tourism Development Project, under consideration by the World Bank, would install solar cell systems to power radio communications at six locations with an average power system cost of $700 (present costs that will be reduced as the technology development programs proceed)(6).

The RCUP will investigate the desirability of incorporating solar cell power sources in two communications systems to enhance communications between Kathmandu and the district centers in project areas.

Wind Power. The government of Nepal and local investigators are interested in exploiting those alternative energy sources that would have wide applicability in the country. In particular, emphasis has been placed on biogas, hydropower and solar heating and drying. Wind power also deserves consideration.

A main difficulty in determining the utility of wind power is the sparse amount of data available on wind velocities. Since the power of a wind machine depends theoretically on the cube of the wind velocity (i.e., doubling the wind velocity will increase the power available by a factor of 8), very accurate data is needed if the machine is to be properly sized for the job to be done.

Existing data gathered at the several airfields and other facilities scattered through the countryside can be used to determine the wind regime for those sites. But the results cannot be reliably applied to other

locations. Steep stream and river valleys might channel the winds, increasing their velocity and enhancing the suitability of wind power. Conversely, hills and ridges might shade sites from the wind and decrease its utility.

An analysis of the potential use of wind power was made for the Khumbu Region (6). Using data from Pheriche, this study concluded that a windmill of three kilowatts rated power (electrical) could produce 20 kilowatt hours output per day. The costs of such a unit might range from $10,000 to $15,000. This compares with the hydropower costs noted earlier of $10,000 for a 15-kilowatt (mechanical) system that would produce five or more kilowatts of electrical power. Since hydropower has the advantage of being a cheaper and a more steady source of power than wind power, the emphasis given to it is deserved.

However, there are sites where wind power is the only good alternative to wood. In the Mustang area for instance, wind velocities reach 40 km/hr during the day, providing the opportunity simultaneously to pump ground water for irrigation and generate electricity. If the uses made of the energy justify the cost of the machine, then there are a number of commercially available wind-driven electricity generators that might be appropriate. The decision should be made with an adequate knowledge of the wind regime, however. Simple measuring stations could be set up to gather the necessary information. These should be established a year or so in advance of a design decision in order to collect at least a year's worth of data. This minimal amount of information would assist in reducing the danger that units might be selected that are either over-sized and over-priced or under-sized and inadequate for the job.

Biomass. Little attention has been given to the assessment of Nepal's biological energy resources. Afforestation and reforestation programs are either in the design stage or are underway, and limited work has been done to develop biogas units. However, there is no central direction being given to utilization of the biologic potential obtainable from intensive silviculture or from what are presently termed barren and waste lands, which are the country's range and pasture lands.

Appropriate direction will be provided by RCUP to encourage both research within country and adaptation of techniques from other countries that promote the conservation and utilization of the biomass potential of Nepal. Pilot agro-forestry projects should be installed and experiments should begin using crop varieties and trees that are capable of growing on the same site. The watershed activity of RCUP should include management of both grasses and shrubs. During the resource inventory stage, barren and waste lands should be critically assessed as to their contribution for forest, range, pasture, or combinations of all three.

Improved Access by Roads and Bridges. Two of the RCUP study areas have roads in use or under construction. The Kathmandu-Birgunj road runs through the western side of Kulekhani with a connection to the new damsite on the Kulekhani Khola. A road is under construction from the Kathmandu-Pokhara road to Gorkha above the Daraundi Kosi. Foot bridges are planned for construction at a number of points under the RCUP. These transportation facilities of course speed communication and increase the flow of supplies and market products within the valleys they serve. From an energy perspective, both favorable and negative impacts result.

Tourism, business, and commerce follow the opening of roads to a new area. Heavy and large equipment can enter the region and construction materials, farm chemicals, and tools--in fact, all imported commodities--arrive in greater variety and abundance than before. Technical advisors and extension specialists can spend more time with people and less time trekking. To the extent that the area produces more food and other products than it consumes, larger markets are available.

Some unfavorable effects go with these advantages if traditional practices in the use of resources are not improved. The demand for water, firewood and food by visitors may create new shortages. These problems must be reduced by taking advantage of the improved communications to speed up the introduction of more efficient resource utilization.

Barriers to Implementing Solutions

1. HMG/N priorities are mostly concentrated and directed to the infrastructure sector (approximately 50 percent of the fifth and the sixth Five-Year

Plan's development budget is in this sector), followed by agricultural production.

2. HMG/N and most bilateral and multilateral donors direct their limited development funds to sectors and projects that do not directly impact upon energy problems.

3. There is a lack of appropriate systems to reach and educate the rural population in order to gain their acceptance, support, and participation to overcome energy problems.

4. Nepal suffers from an acute shortage of trained personnel (both private and public sectors) and the lack of a developed institutional structure coupled with inadequate administrative capabilities to focus on energy concerns.

5. There is a limited number of construction contractors, engineers and suppliers to handle construction activities which relate to energy projects.

6. Nepal has an inadequate transport system to effectively deliver goods and services used to develop and support energy-related projects.

Recommended Actions To Overcome Barriers

It is impossible for RCUP to address all problems associated with energy development in Nepal. However, as RCUP is directed to helping the rural population both directly and by assisting in the development of an infrastructure to support these beneficiaries, the project can act as a catalyst by setting examples as to how to avoid destruction of the resource base, yet obtain higher sustainable yield from indigenous energy resources.

Actions that can be taken to solve the problems and overcome the barriers are:

1. Immediate actions for short-term payoffs:
   a. Fuel wood lots, a component at the RCUP Forestry Project, will make wood more available to local people so that they can lay in a sufficient stock to permit proper drying, thus increasing combustion efficiency;
   b. RCUP will test improved stoves in rural areas and, if successful, engage in extension activities to popularize their use;

c. RCUP will study the introduction of micro-hydro and mini-hydro plants in selected river areas and train a cadre of technicians to monitor and maintain these units; develop power for irrigation, manufacturing of fertilizer, water supplies and electricity;

d. An important component of the RCUP is the reforestation programs using fast growing species of trees to arrest soil erosion and develop woodlots for rural consumers;

e. RCUP will introduce natural resource training for district and national level employees and expand the collection of natural resource data within the inventory and monitoring component of The Watershed Management Project;

f. It will develop alternate fuels such as biomass, biogas, and windmills;

g. Seek improvements in the efficiency of traditional power sources;

h. Integrate policy and procedures for developing woodlots;

i. Provide incentives to encourage private and communal woodlots;

j. HMG/N could incorporate intensive forest management with local participation and improve forest extension service;

k. Construct water impoundments for villages; and

l. Assist in improving watershed management practices.

2. Long-term actions for long-run payoffs:

a. HMG/N could design and construct hydro plants to serve large-scale irrigation, domestic household lighting and energy for rural and urban industries as well as exporting power to India to earn foreign exchange;

b. HMG/N could provide financing for replanting forest areas;

c. HMG/N could consider rural eletrification for irrigation and small-scale agro industries and house connections to improve quality of life;

d. HMG/N could construct small fertilizer plants in the Terai;

e. HMG/N could improve watershed management practices;

f. HMG/N could train and finance a cadre of technicians to manage, repair and administer energy infrastructures (i.e., mini- and micro-hydro power plants);

g. HMG/N could continue seeking capital from international sources to finance major hydro-design and construction;

h. HMG/N could improve local logistical support to accommodate construction contractors and suppliers; and

i. HMG/N could continue negotiating with India to develop hydro plants in Nepal and export power (electricity) to Indian consumers.

3. Actions appropriate for USAID to assist HMG/N (both under and beyond the RCUP):

a. USAID should encourage and promote the development of a Secretarial-level committee within HMG/N focus on energy;

b. USAID should continue to assist HMG/N in establishing and utilizing present institutions relating to energy (training, research and development);

c. USAID should continue to promote the expanding resource data collection in Nepal;

d. USAID should continue to support integrating development activities contributing to increasing food production using readily available energy sources;

e. USAID should support accelerating in-country adaptive research; and

f. USAID should encourage mini- and micro-hydro development.

Table 1 presents the proposed energy program that RCUP will follow incorporating related activities that support conservation and efficient utilization of the project areas resources. This program provides for (1) assessment of renewable and non-renewable resources; (2) support for design and construction of facilities; (3) training of village people to maintain and repair installed works; and (4) the development of energy conservation guidelines.

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Table 1 Proposed Energy Component Program for RCUP [1/]

Program Category	Unit of Accomplishment	First Five Years					Five Year Total	Second 5 Year Total	Third 5 Year Total	15 Year Total
		Year - 1	Year - 2	Year - 3	Year - 4	Year - 5				
A. Stove Improvement	Number									
1. Kulekhani		10	10	10	10	10	50	50	-	100
2. Gorkha		10	10	10	10	10	50	50	50	150
3. Myagdi		5	10	10	10	10	45	50	75	170
4. Mustang		5	10	10	10	10	45	50	75	170
Total		30	40	40	40	40	190	200	200	590
B. Solar Demonstration										
(i) Drying	Number									
1. Kulekhani		-	2	-	2	-	4	-	-	4
2. Gorkha		-	-	2	-	2	4	-	-	4
3. Myagdi		-	-	-	2	2	4	-	-	4
4. Mustang		-	-	2	2	4	8	-	-	8
Total		-	2	4	6	8	20	-	-	20
(ii) Water Heating										
1. Kulekhani		-	1	2	2	2	7	-	-	7
2. Gorkha		-	-	1	2	6	9	-	-	9
3. Myagdi		-	1	2	4	8	15	-	-	17
4. Mustang		-	1	1	4	8	14	-	-	16
Total		-	3	6	12	24	45	-	-	49

(Contd. of Table 1)

Program Category	Unit of Accomplishment	First Five Years					Five Year Total	Second 5 Year Total	Third 5 Year Total	15 Year Total
		Year - 1	Year - 2	Year - 3	Year - 4	Year - 5				
C. Biogas Installation	Units									
1. Kulekhani		2	8	8	10	10	38	40	40	118
2. Gorkha		4	8	8	10	10	40	40	40	120
3. Myagdi		2	4	4	5	5	20	40	40	100
4. Mustang		2	-	-	-	-	2	-	-	2
Total		10	20	20	25	25	100	120	120	340
D. Micro-Hydro Units										
(i) Installations	Numbers									
1. Kulekhani		-	-	-	-	-	-	-	-	-
2. Gorkha		-	Survey	Design	1	-	1	2	2	5
3. Myagdi		Survey	Design	1	-	-	1	2	2	5
4. Mustang		-	-	Survey	Design	2	2	1	2	5
Total		-	-	1	1	2	4	5	6	15
(ii) Maintenance	Number									
1. Kulekhani		-	-	-	-	-	-	-	-	-
2. Gorkha		-	-	-	1	Continue	1	3	5	5
3. Myagdi		-	-	1	Continue	Continue	1	3	5	5
4. Mustang		-	-	-	-	-	-	3	5	5
Total		-	-	1	1	-	2	9	15	15

(Contd. of Table 1)

Program Category	Unit of Accomplishment	First Five Years					Five Year Total	Second 5 Year Total	Third 5 Year Total	15 Year Total
		Year - 1	Year - 2	Year - 3	Year - 4	Year - 5				
E. Bridges	Number									
(i) Foot - 10 Meter Wood										
1. Kulekhani		-	-	-	-	-	-	-	-	-
2. Gorkha		-	-	-	-	-	-	-	-	-
3. Myagdi		-	2	1	-	1	4	2	2	8
4. Mustang		-	-	-	1	-	1	3	3	7
Total		-	2	1	1	1	5	5	5	15
(ii) Suspension	Number									
1. Kulekhani		-	-	-	-	-	-	-	-	-
2. Gorkha		Survey	Design	1	1	-	2	2	1	5
3. Mustang		Survey	Design	1	-	-	1	1	2	4
4. Myagdi		Survey	Design	1	1	-	2	2	2	6
Total		-	-	3	2	-	5	5	5	15
F. Multi-Purpose Impoundment										
1. Gorkha	Number	Survey	Design	1	-	-	1	-	-	1

1/ Refer to the Program Guide for RCUP output for input to energy program from following categories.

(a) Inventory and monitoring (basic resource surveys).
(b) Watershed Management (climatological and hydrologic stations, wind mills and groundwater test drilling).
(c) Forest Management (demonstration sawmills and charcoal).

Table 2

Proposed Energy Capital Cost in Thousand Rupees for Resource Conservation and Utilization Project

Program Category	Unit Costs Rs.	First Five Years										First Five Years Total		Second Five Years Total		Third Five Years Total		15 Years Total	
		Year - 1		Year - 2		Year - 3		Year - 4		Year - 5									
		NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.
A. Stove Improvement	150/unit																		
1.Kulekhani		1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	7.5	2.5	7.5	2.5	-	-	15.0	5.0
2.Gorkha		1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	7.5	2.5	7.5	2.5	7.5	2.5	22.5	7.5
3.Myagdi		.75	0.25	1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	6.75	2.25	7.5	2.5	7.5	2.5	21.75	7.25
4.Mustang		.75	0.25	1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	6.75	2.25	7.5	2.5	7.5	2.5	21.75	7.25
Sub-Total		4.50	1.5	6.0	2.0	6.0	2.0	6.0	2.0	6.0	2.0	28.5	9.5	30.0	10.0	22.5	7.5	81.00	27.0
B.Solar Demonstration	1000/unit																		
i)Cooking																			
1.Kulekhani		-	-	2.0	1.0	-	-	2.0	1.0	-	-	4.0	2.0	-	-	-	-	4.0	2.0
2.Gorkha		-	-	-	-	2.0	1.0	-	-	2.0	1.0	4.0	2.0	-	-	-	-	4.0	2.0
3.Myagdi		-	-	-	-	-	-	2.0	1.0	2.0	1.0	4.0	2.0	-	-	-	-	4.0	2.0
4.Mustang		-	-	-	-	2.0	1.0	2.0	1.0	4.0	2.0	8.0	4.0	-	-	-	-	8.0	4.0
Sub-Total		-	-	2.0	1.0	4.0	2.0	6.0	3.0	8.0	4.0	20.0	10.0	-	-	-	-	20.0	10.0
ii)Water Heating	10,000/unit	-																	
1.Kulekhani		-	-	10.0	5.0	20.0	10.0	20.0	10.0	20.0	10.0	70.0	35.0	-	-	-	-	60.0	30.0
2.Gorkha		-	-	-	-	10.5	5.0	20.0	10.0	60.0	30.0	90.0	45.0	-	-	-	-	90.0	45.0
3.Myagdi		-	-	10.0	5.0	20.0	10.0	40.0	20.0	80.0	40.0	150.0	75.0	-	-	-	-	150.0	75.0
4.Mustang		-	-	10.0	5.0	10.0	5.0	40.0	20.0	80.0	40.0	140.0	70.0	-	-	-	-	140.0	70.0
Sub-Total		-	-	30.0	15.0	60.5	30.0	120.0	60.0	240.0	120.0	450.0	225.0	-	-	-	-	440.0	220.0
C.Biogas																			
i)Installation	7000/unit																		
1.Kulekhani		14.0	7.0	56.0	28.0	56.0	28.0	70.0	35.0	70.0	35.0	266.0	133.0	280.0	140.0	280.0	140.0	826.0	413.0
2.Gorkha		28.0	14.0	56.0	28.0	56.0	28.0	70.0	35.0	70.0	35.0	280.0	140.0	280.0	140.0	280.0	140.0	840.0	420.0
3.Myagdi		14.0	7.0	28.0	14.0	28.0	14.0	35.0	17.5	35.0	17.5	140.0	70.0	280.0	140.0	280.0	140.0	700.0	350.0
4.Mustang		14.0	7.0	-	-	-	-	-	-	-	-	14.0	7.0	-	-	-	-	14.0	7.0
Sub-Total		70.0	35.0	140.0	70.0	140.0	70.0	175.0	87.5	175.0	87.5	700.0	350.0	840.0	420.0	840.0	420.0	2380.0	1190.0
ii)Research(High Altitude)		-	-	300.0	150.0	300.0	150.0	300.0	150.0	300.0	150.0	1200.0	600.0	-	-	-	-	1200.0	600.0

(Contd. of Table 2)

Program Category	Cost Costs Rs.	First Five Years										First Five Years Total		Second Five Years Total		Third Five Years Total		15 Years Total	
		Year - 1		Year - 2		Year - 3		Year - 4		Year - 5									
		NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.
D.Micro-Hydro-units																			
i)Installation	260,000/KW																		
1.Kulekhani		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.Gorkha		-	-	-	-	-	-	1200.0	600.0	-	-	1200.0	600.0	2400.0	1200.0	2400.0	1200.0	6000.0	3000.0
3.Myagdi		-	-	-	-	1200.0	600.0	-	-	-	-	1200.0	600.0	2400.0	1200.0	2400.0	1200.0	6000.0	3000.0
4.Mustang		-	-	-	-	-	-	-	-	2400.0	1200.0	2400.0	200.0	1200.0	600.0	2400.0	1200.0	6000.0	3000.0
Sub-Total		-	-	-	-	1200.0	600.0	1200.0	600.0	2400.0	1200.0	4800.0	2400.0	6000.0	3000.0	7200.0	3600.0	18000.0	9000.0
ii)Maintenance																			
1.Kulekhani		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.Gorkha		-	-	-	-	-	-	-	-	6.0	-	6.0	-	90.0	-	180.0	-	276.0	-
3.Myagdi		-	-	-	-	-	-	6.0	-	6.0	-	12.0	-	90.0	-	180.0	-	282.0	-
4.Mustang		-	-	-	-	-	-	-	-	-	-	-	-	120.0	-	150.0	-	270.0	-
Sub-Total		-	-	-	-	-	-	6.0	-	12.0	-	18.0	-	300.0	-	510.0	-	828.0	-
E.Bridges																			
i)Foot - 10 meters wood	9000/bridge																		
1.Mustang		-	-	-	-	-	-	9.0	-	-	-	9.0	-	27.0	-	27.0	-	63.0	-
2.Myagdi		-	-	18.0	-	9.0	-	-	-	9.0	-	36.0	-	18.0	-	18.0	-	72.0	-
Sub-Total		-	-	18.0	-	9.0	-	9.0	-	9.0	-	45.0	-	45.0	-	45.0	-	135.0	-
ii)Suspension	1656000/Bridge																		
1.Gorkha		160.0	80.0	171.2	85.6	1490.4	745.2	1490.4	745.2	-	-	3312.0	1656.0	3312.0	1656.0	1656.0	828.0	8280.0	4140.0
2.Mustang		80.0	40.0	85.6	42.8	1490.4	745.2	-	-	-	-	1656.0	828.0	1656.0	828.0	3312.0	1656.0	6624.0	3312.0
3.Myagdi		160.0	80.0	171.2	85.6	1490.4	745.2	1490.4	745.2	-	-	3312.0	1656.0	3312.0	1656.0	3312.0	1656.0	9936.0	4968.0
		400.0	200.0	428.0	214.0	4471.2	2235.6	2980.8	1490.4	-	-	8280.0	4140.0	8280.0	4140.0	8280.0	4140.0	24840.0	12420.0

(Contd. of Table 2)

Program Category	Cost Costs Rs.	First Five Years										First Five Years Total		Second Five Years Total		Third Five Years Total		15 Years Total	
		Year - 1		Year - 2		Year - 3		Year - 4		Year - 5									
		NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.	NRs.	F.E.
F.Multipurpose Impoundments																			
1. Gorkha	18400,000/-	900.0	398.2	1000.0	483.6	8200.0	1861.8	8280.0	1244.0	100.0	-	18400.0	3987.0	-	-	-	-	18400.0	3987.6
G.Consultancy		100.0	-	100.0	-	100.0	-	-	-	-	-	300.0	-	-	-	-	-	300.0	-
Total Project Cost N..C.Rs		1474.5	634.7	2024.0	935.6	14490.2	4951.4	13002.8	3636.9	3250.0	1563.5	34241.5	11722.10	15495.0	7570.0	16897.5	8167.5	66634.0	27459.6
US $		123.90	53.34	170.08	78.62	1217.66	416.08	1092.67	305.62	273.11	131.39	2877.42	985.05	1302.1	636.13	1419.98	586.34	5599.48	2307.52
1.Kulekhani		15.5	-	69.5	-	77.5	-	93.5	-	91.5	-	347.5	-	287.5	-	280.0	-	915.0	-
2.Gorkha		1089.5	-	1128.7	-	9659.9	-	10881.9	-	139.5	-	22899.5	-	6089.5	-	4523.5	-	33512.5	-
3.Myagdi		174.75	-	228.7	-	2748.9	-	1574.9	-	133.5	-	4860.75	-	6107.5	-	6197.5	-	17165.75	-
4.Mustang		94.75	-	97.1	-	1503.9	-	52.5	-	2485.5	-	4233.75	-	3010.5	-	5896.5	-	13140.75	-
5.Research		-	-	400.0	-	400.0	-	400.0	-	400.0	-	1600.0	-	-	-	-	-	1600.0	-
6.Consultancy		100.0	-	100.0	-	100.0	-	-	-	-	-	300.0	-	-	-	-	-	300.0	-
Total Project Cost N.C.Rs.		1474.5	634.7	2024.0	935.6	14490.2	4951.4	13002.8	3636.9	3250.0	1563.5	34241.5	11722.10	15495.0	7570.0	16897.5	8167.5	66634.0	27459.6
U.S. $		123.90	53.34	170.08	78.62	1217.66	416.08	1092.67	305.62	273.11	131.39	2877.42	985.05	1302.10	636.13	1419.96	686.34	5599.48	2307.52

APPENDIX G

IRRIGATION COMPONENT

Prepared by: APROSC

RESOURCE CONSERVATION AND UTILIZATION PROJECT

IRRIGATION COMPONENT

CONTENTS

List of Design Team Participants i

List of Attachments ii

Summary iii

Introduction 1

Field Methods 2

Irrigation and Water Management Situation 2

Population Density 4

Appraisal of Water Resources 4

Strategies for Project Implementation 11

RCUP Planned Irrigation Coverage 11

Investment Needs 12

Implementing Agencies 14

Operation and Maintenance 15

Manpower Needs 15

Local Labor Mobilization 17

Training 17

Design Criteria 18

Conclusion 19

Attachments 20

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List of Attachments

Cost Summary of Irrigation Component . . . . . 1.1.1 . . . 20

Financial Outlay for Line Agencies . . . . . 2.1.2 . . . 21

Summary on Proposed Irrigation Schemes

Kulekhani . . . . . 3.1.3 . . . 22

Daraundi . . . . . 3.2.4 . . . 23

Kaligandaki (Myagdi) . . . . . 3.3.5 . . . 24

Kaligandaki (Mustang) . . . . . 3.3.6 . . . 25

Summary on Irrigation Improvement Schemes (Mustang). . 3.3.7 . . . 26

Projects To Be Implemented by Irrigation Department

Daraundi . . . . . 4.1.8 . . . 27

Kaligandaki . . . . . 4.2.9 . . . 28

Projects To Be Implemented by L.D.D.

Kulekhani . . . . . 5.1.10 . . . 29

Daraundi . . . . . 5.2.11 . . . 30

Kaligandaki . . . . . 5.3.12 . . . 31

Projects To Be Implemented by DSWC

Daraundi . . . . . 6.1.13 . . . 32

Upper Kaligandaki . . . . . 6.2.14 . . . 33

Maps

Kulekhani Catchment Area 34

Daraundi Catchment Area 35

Upper Kali Gandaki Catchment Area (Myagdi) 36

Upper Kali Gandaki Catchment Area (Mustang) 37

Summary

Present irrigation coverage is very dissappointing in the hills of of three catchments under study, as are the irrigation systems and practices which do exist. Only about 8% of cultivated land is currently under some kind of irrigation. Lack of adequate maintenance and poor construction practices have accelerated the degradation of limited and valuable land resources in these areas. Therefore it is a very urgent task, on the one hand, to increase land under irrigation and, on the other hand, to improve existing irrigation systems.

Irrigation is essential to safeguard agricultural production in these areas from unfavorable weather conditions in order to make them self-sufficient in food. From the conservation point of view, irrigation will also prevent cultivation of marginal steep slopes for want of sufficient production in the areas more suited to agriculture. Improvement of existing canals and water management is equally important to prevent further soil erosion in these catchments. This will also save considerable manpower that is currently engaged in repairing diversions and breached canals.

About 38% of the land in the Kulekhani area is cultivated, with only 8% under irrigation. The Daraundi catchment contains nearly 39% cultivated land with irrigation coverage of nearly 8%. The Kaligandaki catchment in Mustang contains only about 3000 ha of cultivated land, 50% of which is irrigated; but, irrigation coverage on the Kaligandaki catchment in the Myagdi district is again about 8%.

A shortage of professional manpower and skilled labor has been a major constraint in the implementation and the quality of design of irrigation schemes. The rough terrain is equally challenging and the lack of a developed infrastructure is another difficulty encountered when one attempts to apply modern irrigation technology in these regions. So, at the outset, only simple gravity flow schemes have been included in this study.

RCUP plans to construct 19 new irrigation projects and improve 19 existing projects in the three catchments. 577 ha of new land will be irrigated by the end of the first five years of the RCUP, and 565 ha will have improved facilities by the end of the fifth year. The following table summarizes the irrigation activities in three catchments.

SUMMARY ON IRRIGATION COMPONENT

	Proposed New Schemes		Improvement Schemes	
	No. of Schemes	Area Irrigable ha	No. of Schemes	Area Irrigated ha
Kulekhani Catchment	2	47	3	55
Daraundi Catchment	6	284	4	135
Upper Kaligandaki Catchment	11	246	12	375
Total	19	577	19	565

Though the RCUP irrigation coverage of about 2% of cultivated land in each catchment is far behind the national sectoral plan of irrigating 25% of cultivated land in 10 years (1981-1990), it is hoped that RCUP will help toward fulfilling the national plan. The RCUP irrigation component has been formulated for five years only, and further programs are to be worked out during the planning of the second five-year phase.

The total cost for implementing the irrigation schemes has been estimated at Rs. 17,103,000. The cost consists of the following components:

Project Construction Cost	Rs. 13,003,000
Engineering Cost	Rs. 1,950,000
Inland Training Cost	Rs. 150,000
Equipment	Rs. 2,000,000
Total	Rs. 17,103,000

The total foreign currency expenditure is projected 7,619,000 NRS., about 44% of the total cost. The financial outlay in each catchment is as follows:

Kulekhani Catchment	Rs. 1,316,000 *
Daraundi Catchment	Rs. 4,391,000 *
Kaligandaki Catchment	Rs. 7,296,000 *

*The costs are project construction costs only.

Mainly three agencies, The Department of Irrigation, Hydrology and Meteorology (DIHM), The Local Development Department (LDD) and The Soil and Water Conservation Department (SWCD) will be involved in implementation. Six projects will be managed by the Irrigation Department, 20 schemes by LDD and 12 schemes by The Soil and Water Conservation Department. Operation and maintenance will be done by local panchayats.

The modest target of this component of the RCUP does not call for additional professional manpower in different departments, except in LDD. The total required manyears of engineers and overseers will be 15 and 27 manyears respectively over the five-year span of the project. Provisions have been made for training and orientation programs for low level technicians such as plumbers.

IRRIGATION COMPONENT

Introduction

With an ever-increasing population and thus an ever-growing pressure on land resources, which has been leading to deforestation and consequently to widespread erosion, conservation of resources has become a necessity. The goodgrain production situtation is about at a standstill, worsened by adverse weather conditions. It is necessary, therefore (1) to safeguard agricultural production from unfavorable weather conditions by providing permanent irrigation facilities and (2) to improve existing irrigation systems of the farmers in order to conserve water and valuable land. The irrigation component of The Resource Conservation and Utilization Project addresses both of these needs in three catchments of the Kaligandaki, Daraundi and Kulekhani Rivers.

More and more of the hill forests have been cleared for cultivation as the population has increased. In addition, whenever land on river banks is innundated or washed away, people are naturally forced to move uphill. This situation is seen in all three catchments under study. Cultivation is practiced not only in valleys and terraced hill slopes, but also on small patches of very steep hill slopes, where terracing is not possible. The present study seeks to rehabilitate the marginal steep slopes by increasing production on land better suited to agriculture.

Many traditional canals in these catchments are outstanding examples of the technical capability of the local farmers. But crude overirrigation of terraces have created grave erosion problems in the hills. Every year the topsoils from faulty terraces are washed away, and there is evidence of declining production, probably also from this cause. The canals are also damaged each year during the monsoon, as traditional intakes have temporary dry stone diversions only and no gates to limit the inflow into the canal. The temporary diversions are washed away very often by flash floods, common in the hills. This study seeks to identify such irrigation systems and to provide them with flow-limiting devices.

Almost all traditional irrigation is of the run-of-river type. During low flows in the dry season, the canals are dry or nearly dry. It is important to reduce such losses for irrigation purposes.

Field Methods

The projects in this study were identified by technician visits to each of the Panchayat areas. Relevant data were collected in questionnaire forms. Besides this, the visiting teams conducted preliminary investigations on the feasibility of projects suggested by the community. The investigations included approximate measurement of canal lengths and source discharges.

Each team of two overseers visited about five Panchayats in each catchment. About four teams worked in one catchment simultaneiously under the supervision of an agri-engineer and a civil engineer.

Kulekhani was the first area visited, followed by the Daraundi and Kaligandaki catchments respectively. Discharge stimates should be reasonably minimal, as Kulekhani was visited in February, Daraundi in March/April, and Kaligandaki in May/June. However, it was difficult to determine the extent of irrigated and potentially irrigable areas. Cadastral survey data was used where available; otherwise, Panchayat sources or eye estimates were accepted for this preliminary study.

Irrigation and Water Management Situation

Kulekhani, the smallest catchment, contains about 38% cultivated land. That amounts to about 8000 ha out of the total area of 21,100 ha of catchment area. A much smaller portion, about 600 ha, is irrigated. Thus irrigation coverage in the catchment amounts to only 8% of total cultivated land.

The Daraundi catchment, about 795 sq km, has almost the same percentage of cultivated land as in Kulekhani, about 39% of total land area. Though no specific data are available, irrigation coverage is judged to be below 8%.

The upper Kaligandaki catchment is divided into two parts, part in the district of Myagdi and part in Mustang. The Myagdi area contains about 16% cultivated land, and only about 3000 ha is cultivated in Mustang District. The low figures are due to a substantial amout of the land area being under snow. The irrigation coverage is estimated at 10% in Myagdi and about 50% in Mustang. The high figure in Mustang is insignificant however, because the total cultivated land does not exceed 3000 ha.

Obviously, only a small percentage of cultivated land in these three catchments is irrigated. Two causes of such low irrigation coverage are that a considerable amount of the cultivated area lies on hill slopes and that water is scarce. Pumping is often not feasible, as rivers flow several hundred meters below the fields at the bottom of the hill. An example of such a situation is Sisneri village in Kulekhani catchment. However, the main problems with irrigation are financing and the lack of technical knowhow rather than the rough topography of the sites.

The irrigation systems in all three catchments have similar problems. The result of nonavailability of technical supervision leads to a lack of understanding on the part of the villagers to the importance of soil and water conservation. Diversion structures are usually of dry wall stone. Clay and tree leaves are used to prevent leakage in the diversion. The canals are unlined and have no flow-limiting devices to protect them from flooding. The result is that the upstream stretch of the canal is highly silted and does not permit enough water to enter, or is washed away entirely. The seepage losses in unlined channels are often very high and are a constraint on adequate irrigation during the dry season. In the Mustang area in particular, the seepage losses are very high because of the nature of the soil in the region. The HADP project in Ghykar, Mustang region, provides a good example of the conservation of soil and water. High density polyethylene (HDPE) pipes have been used partially for conveyance of water in the project.

Water conservation not only provides for adequate water supplies and greater irrigation coverage, but also for prevention of potential landslides. Excess percolation in canals in the study area was observed to have triggered landslides along canal alignments, where the terrain is steep. It was also noted that canals frequently had very steep longitudinal slopes which heavily scored the bed, thus disturbing the stability of the terrain traversed by the canal.

Water management at the farm level is nonexistant. Farmers do not understand amounts or calendars for water application and usually irrigate with as much water as possible. This might have reduced crop production levels in irrigated fields to some extent, while other fields are producing

at less than their potential because of lack of water. Furthermore, water in irrigated fields is allowed to fall freely from a higher terrace to a lower one. The lack of drainage drop structures has aggravated erosion. Water distribution is unsatisfactory and conflicts over water use are common.

Farmers in all three catchments are very keen to receive aid for irrigation improvements, except for cultivators at higher altitudes (over 6000 feet) in the Myagdi area. One reason for this group's lack of interest could be attributed to lower temperatures on their land, making it unsuitable for rice, which is thought to be the only crop necessary to irrigate. The steep topography of upper Myagdi also plays a part. The region is in a belt of severe erosion potentiality and canal alignment would be difficult. A third reason could be the relatively better financial position of the people living in upper Myagdi, many of whom receive pensions from foreign armies in which they have served. This might result in decreased interest in agriculture on their part.

Population Density

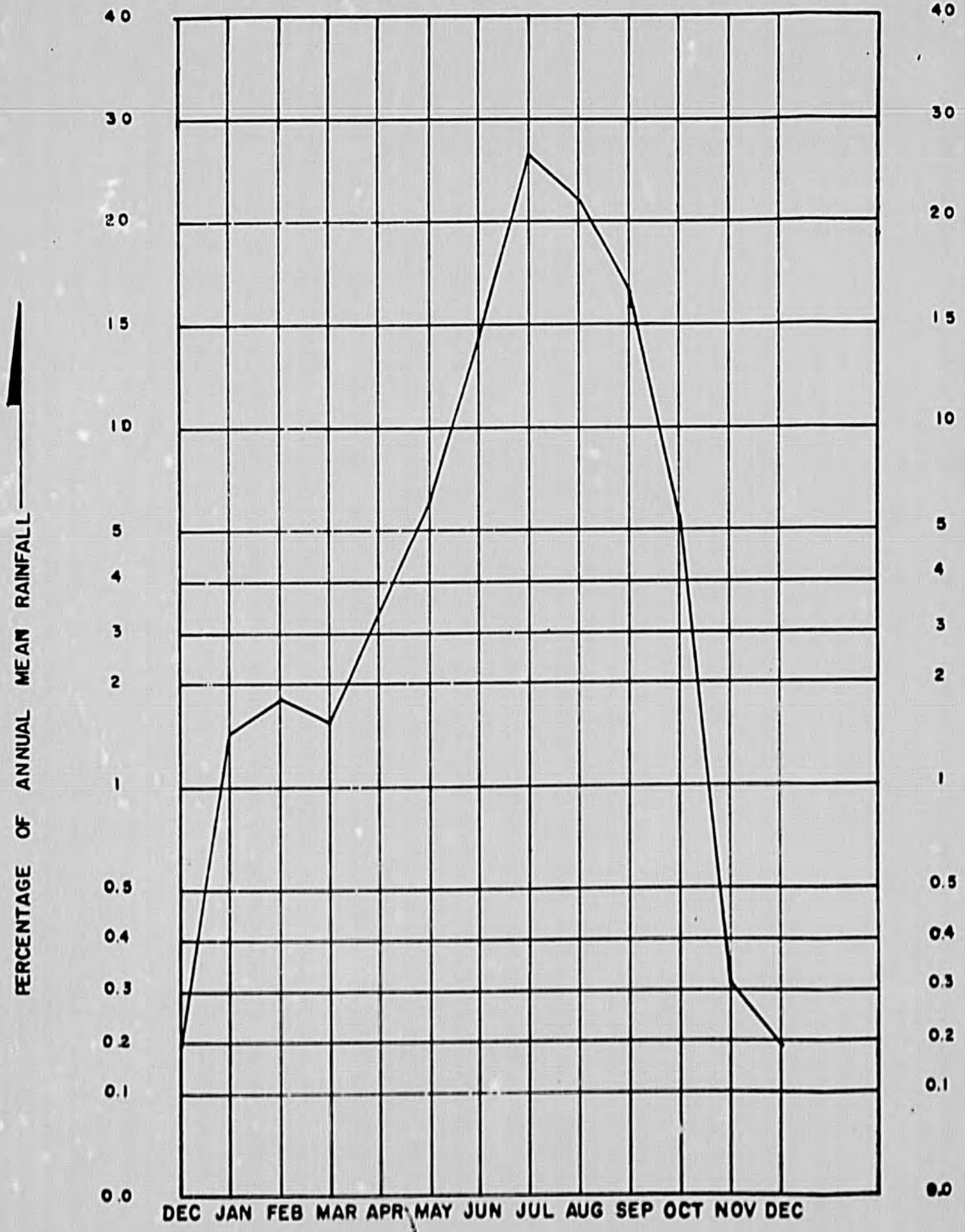
The population pressure on cultivated land is highest in Kulekhani. The second place is occupied by Daraundi catchment. Mustang comes third, followed by Myagdi.

Region	Persons/Cultivated Area
Kulekhani Catchment	4.5 persons/ha
Daraundi Catchment	4.0 persons/ha
Mustang Area (Kaligandaki Catchment)	3.0 persons/ha
Myagdi Area (Kaligandaki Catchment)	2.5 persons/ha

Appraisal of Water Resources

Kulekhani Catchment:

A. Rainfall: Two weather stations, one at Markhu (altitude 1530 m) and one at Daman (altitude 2314 m), provide data for the project area. Markhu station records about 1750 mm average annual rainfall. Daman, though located at a higher altitude, records about the same amount of rainfall. Maximum 24-hour intensities of up to 152 mm have been recorded at Markhu. Most of the rainfall, about 79%, is monsoon rainfall, (See seasonal distribution of rainfall figures.)



SEASONAL DISTRIBUTION OF RAINFALL KULEKHANI MARKHU

B. Meteorology: Presently no stations record pan evaporation data in the Kulekhani basin. However, evaporation records at Chisapani for a period of February 1963 to March 1965 are available. A standard 20 cm pan was used (Kulekhani Hydel Project, feasibility study). The evaporation data is presented in the following chart.

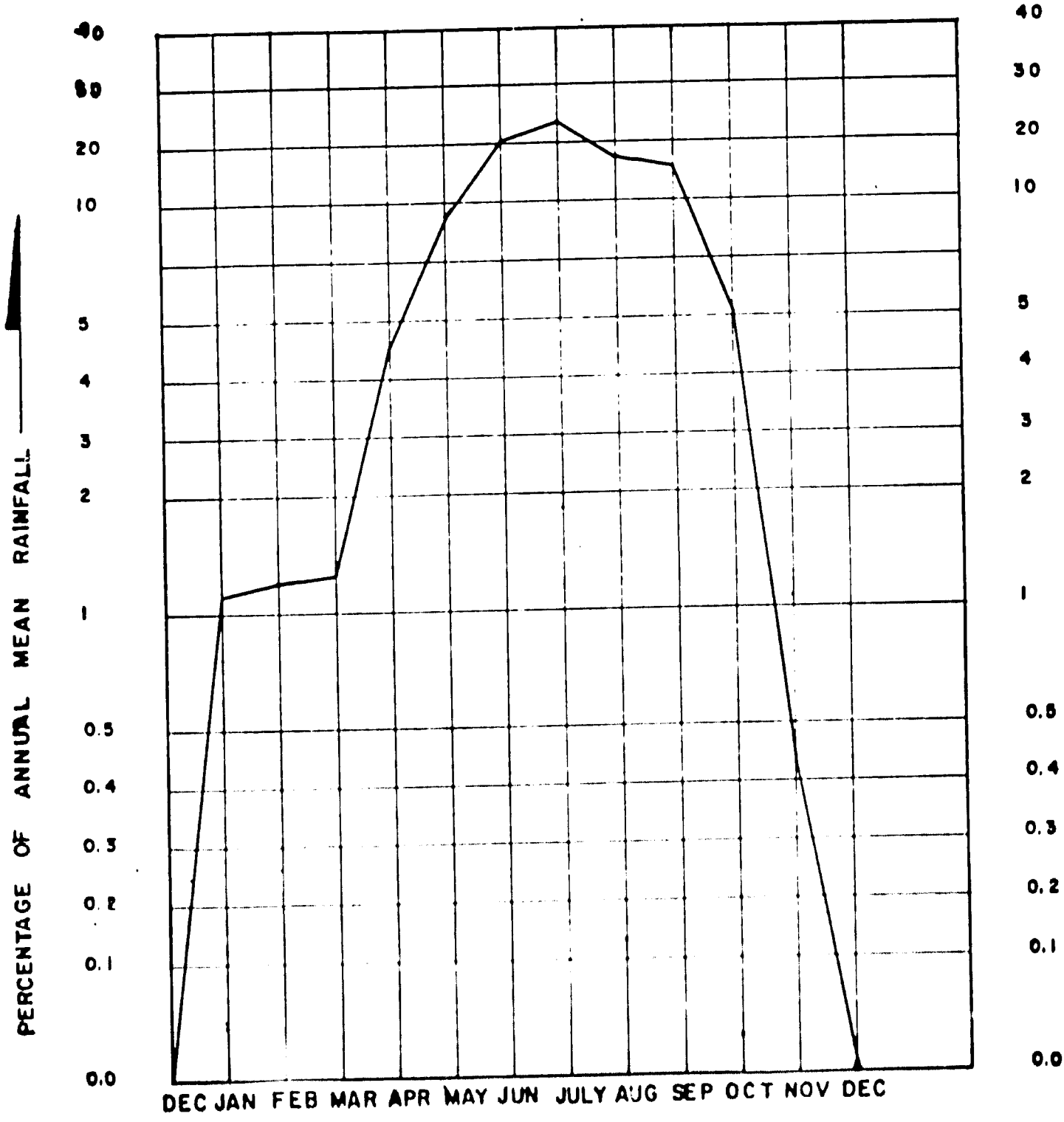
MONTHLY EVAPORATION RECORDS AT CHISAPANI

Month	Year			Mean
	1963	1964	1965	
January	--	63.5	89.1	76.3
February	48.4	96.7	121.1	109.0
March	169.1	214.7	203.1	195.6
April	326.5	310.9	--	318.7
May	392.7	333.2	--	363.0
June	198.6	291.8	--	245.2
July	87.0	82.5	--	84.8
August	48.3	119.6	--	84.0
September	69.3	90.6	--	80.0
October	81.9	124.3	--	103.1
November	68.8	108.6	--	88.7
December	59	74.6	--	66.8

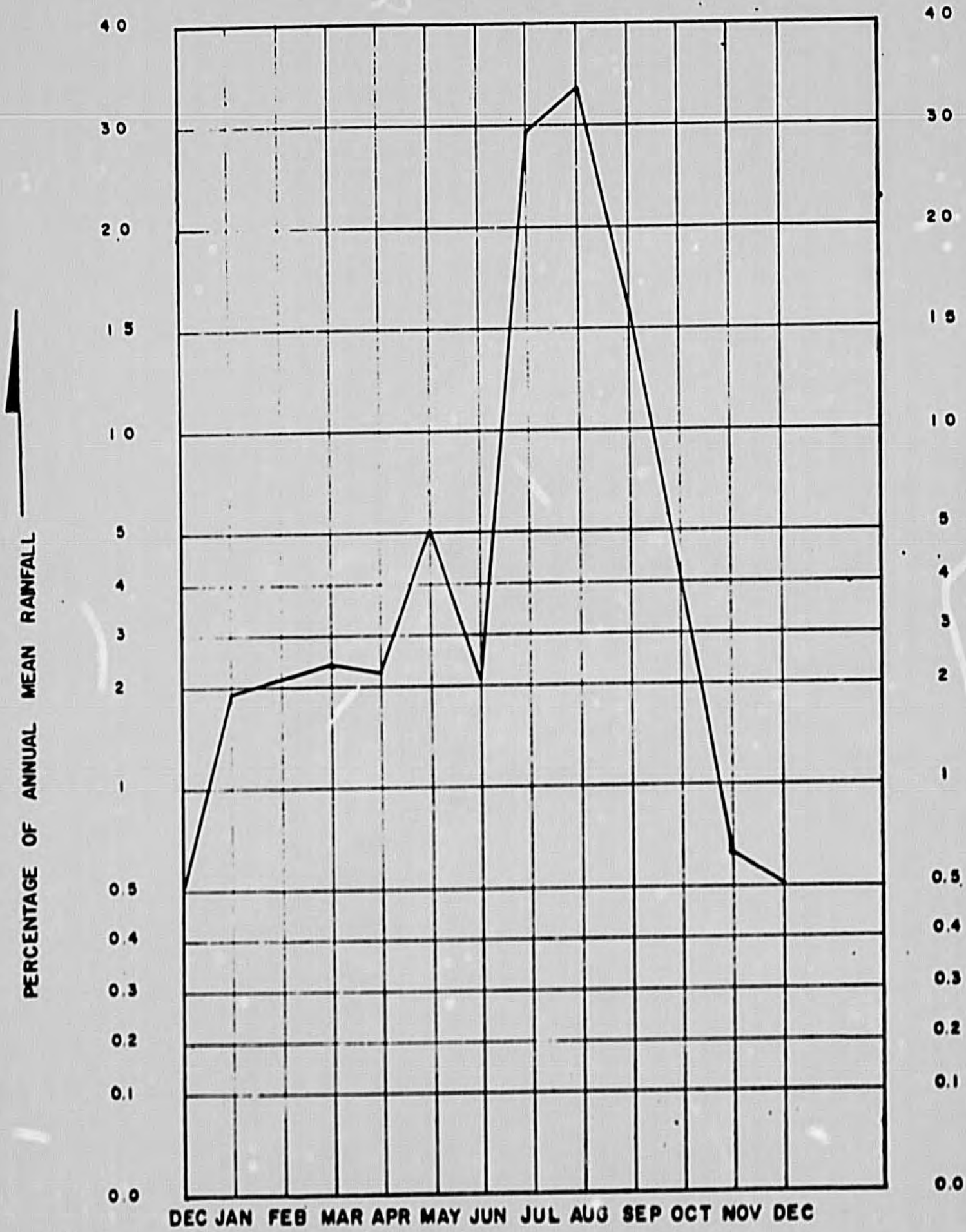
SOURCE: Feasibility study of Kulekhani Hydel Project. The data reveals that evaporation is highest in the premonsoon period of April-May and lowest in the winter, around December.

Daraundi Catchment:

A. Rainfall: There are two climatological stations in the Daraundi basin: Gorkha (altitude 1097 m) and Setibas (also called Jagat, altitude 1330 m). Gorkha station keeps temperature and precipitation records. The stations records average annual precipitation at around 1830 mm. Setibas, at a higher altitude, gets about 1600 mm of rainfall, with the level of measurement probably decreasing with an increase in altitude.



SEASONAL DISTRIBUTION OF RAINFALL GORKHA.



SEASONAL DISTRIBUTION OF RAINFALL MYAGDI BENI BAZAI

Seventy-six percent of annual total rainfall is monsoon precipitation. Maximum 24-hour intensities have been recorded as high as 141 mm.

B. Meteorology: Gorkha station has no evaporation records. In addition to precipitation data it only keeps data on sunshine hours and soil temperatures. Monthly evapotranspiration has been calculated by empirical methods, using the Christiansen formula. As at Kulekhani, the peak evaporator appears to take place in April and May, in the premonsoon period.

Relative humidity at Gorkha station reaches a maximum during the monsoon period (June-September), about 90% on the average. The temperature drops down to +5°C during January and rises to a peak of 31°C around April.

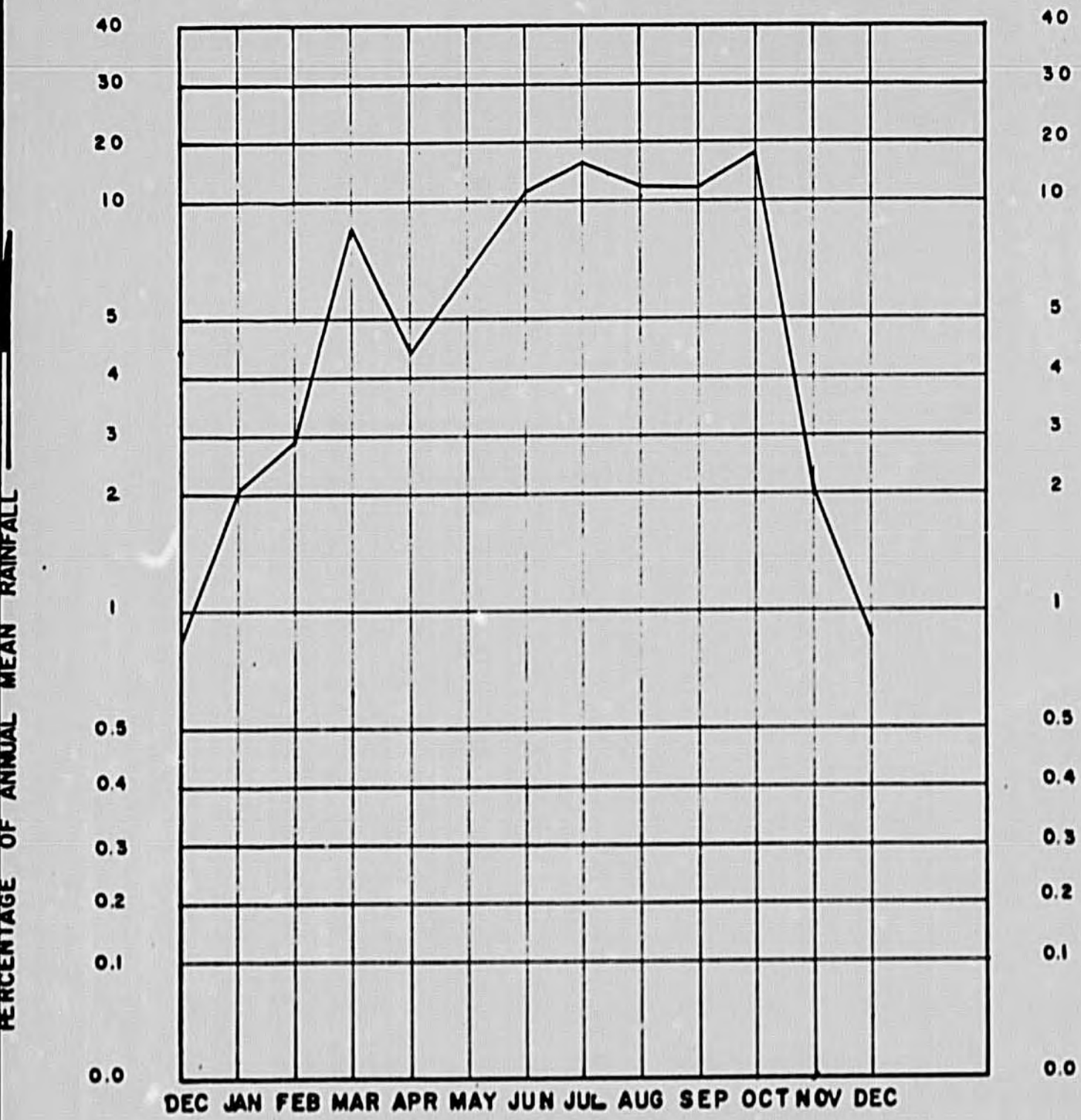
Upper Kaligandaki Catchment:

A. Rainfall: Climatological stations at Beni Bazar (altitude 835 m) and Tatopani (altitude 1240 m) record various data for Myagdi district. Tatopani station shows average annual precipitation to be about 1450 mm, and Beni Bazar about 1620 mm. Maximum 24-hour precipitation in Beni has been recorded as 150 mm. Tatopani has recorded maximum intensity at about 80 mm. Monsoon precipitation is 81% of total annual rainfall at Beni.

B. Meteorology: No supplementary data for evaporation is available for Myagdi. However, looking at temperature variations and other factors, it is estimated that evaporation patterns in the Beni region are similar to those in Gorkha. Thus, maximum monthly evapotranspiration is calculated to occur during the premonsoon (April and May) at about 230 mm.

Mustang Area:

A. Rainfall: Six stations in this upper catchment area provide fairly large amounts of precipitation data for the region. Records from the six stations show that amounts of precipitation are inversely related to altitude. Lomanthange, the highest recording station at 3705 m, gets only about 190 mm of total annual rainfall. Jomson (altitude 2744 m) receives about 300 mm of total annual rainfall. Thakmarpha (altitude 2566 m) records have been taken as the average for the project area. The Thakmarpha records show 350 mm of average annual rainfall. Muktinath records slightly more rainfall than Thakmarpha. Ghami station has only partial records. Maximum 24-hour rainfall intensity of up to 39 mm has been recorded at Thakmarpha. The area is little influenced by monsoon; 53% of total annual precipitation falls during the monsoon.



SEASONAL DISTRIBUTION OF RAINFALL MUSTANG THAK MARPHA

Meteorology: Thakmarpha station provides data on soil temperature and wind, but no evaporation records are available. Relative humidity reaches 75-80% during January and February and stays around 80% from through September. Temperatures drop to 4°C during January and rise to a maximum of 21°C in June-July.

Monthly evaporation calculated from the above data reaches a maximum in June of about 174 mm.

Strategies for Project Implementation

The main goals of this component of the RCUP are:

1. To provide irrigation facilities by simple gravity flow to increase crop production, which will gradually create opportunities for reclamation of marginal land.
2. Improving irrigation systems from intake to farm level, to reduce further soil erosion problems.

Simple gravity flow irrigation has been chosen as the technique of application in the RCUP because the project sites are not readily accessible by road. Transportation of equipment and fuel that wuld be necessary in a more sophisticated project is very difficult. Besides the simplest machines, such as hydrams, equipment has been seen sitting idle for lack of maintenance. In addition, electric power required for pumping is in short supply or unavailable in the project areas.

Use of local materials will be encouraged. However, conveyance by pipe is deemed to be safer and cheaper than stone masonry in cement mortar, especially where the terrain is very steep. HDPE pipes are recommended as an alternative to stone masonry lined canals, because transportation and storage of cement presents serious problems. HDPE pipes can be transported and stored in the open in any season, whereas cement will solidify if it is exposed to dampness, which, under current conditions, is very likely to happen.

RCUP Planned Irrigation Coverage

An HMG 10-year sectoral plan (1980-1990) projects a major improvement in irrigation coverage in Nepal. The plan is to provide irrigation facilities

for 25% of the land in the hills, and 40% in the Terai. The RCUP would contribute toward this goal by providing irrigation for 2%.

Kulekhani, Daraundi and Kaligandaki of the total cultivated land in the catchments over five years. Further programs will be formulated while preparing concrete plans for the second five years of the RCUP during review of the achievements of the first five years of the project.

Kulekhani Catchment. At the end of the fifth year, this catchment will have about 47 ha of newly irrigated land. Irrigation systems on 55 ha of land will be improved. Thus about 1.3% of cultivated land in Kulekhani will get new or updated irrigation facilities.

Daraundi Catchment. Daraundi catchment will have 284 ha of newly irrigated land through implementation of 6 irrigation schemes during the first five years at the RCUP. In addition, four projects will accomplish the improvement of existing irrigation facilities in 135 ha. RCUP irrigation coverage will therefore be about 1.36% of total cultivated land.

Upper Kaligandaki Catchment. In this catchment, some 246 ha will get new irrigation facilities, while about 375 ha of farmland will have their conveyance and distribution systems improved. The RCUP irrigation coverage will be about 3.3% of total cultivated land.

Altogether, RCUP plans to irrigate 377 ha of land and to improve irrigation systems of 565 ha in the three project catchments. This rather modest target has been chosen out of a concern that a larger target might fail for want of professional and skilled personnel for the execution stage. The proposed project can be implemented by the existing staff of the DSWC and LDD. The only additional personnel necessary will be the addition of some engineers and overseers at LDD.

Investment Needs

The investment needed for implementation of the various schemes under this component is shown in Table 1. The costs have been subdivided into four categories.

Project Construction Cost. These costs include direct construction and supervision costs. The cost figures were arrived at after preliminary inspection of each scheme by the survey party.

Engineering Cost. This cost comprises consulting fees of the local consultants, who will be hired in the first year for detailed design work.

Training Cost. Some investment towards training low-level technicians has been foreseen. The cost of overseas orientation programs is included in the discussion of the overall RCUP training program and is not covered in this statement of training costs.

Tools and Equipment. A lump sum has been included for tools, equipment and transport vehicles. This cost shall be incurred in the first year of the project.

INVESTMENT NEEDED IN IRRIGATION COMPONENT

Catchment	Project Construction Cost 000[1] N.Rs.	Engineering Cost 000[1] N.Rs.	Training Cost 000[1] N.Rs.	Total 000[2] N.Rs.
Kulekhani	1316	197	25	1538
Daraundi	4391	659	50	5100
Upper Kaligandai	7296	1094	75	8465
Subtotal	13013	1950	150	15103
Tools/Equipment				2000

[1]Training cost is allocated to DIHM.

[2]Tools and equipment cost shall be divided approximately equally among implementing agencies.

[3]The project construction cost also includes cost of water management part of various irrigation schemes.

FINANCIAL OUTLAY

Year	Irrigation Department	Local Development Department	Soil and Water Conservation Department	Total
	000'N.Rs.	000'N.Rs.	000'N.Rs.	000'N.Rs.
1st Year	1293	1653	1034	3980
2nd Year	1423	2027	536	3986
3rd Year	1460	2346	525	4331
4th Year	556	1820	850	3226
5th Year	438	496	646	1580
Total	5170	8342	3591	17103

The first year cost includes total engineering, tool and equipment costs. The inland training cost has been included in The Department of Irrigation, Hydrology and Meteorology (DIHM) allocation and distributed equally over five years.

Implementing Agencies

In the main, three government line agencies will be involved in construction of irrigation works: The Department of Irrigation Hydrology and Meteorology (DIHM), The Local Development Department (LDD) and The Soil and Water Conservation Department (SWCD). The Department of Irrigation has been undertaking major irrigation projects in the country, while relatively minor projects are implemented by The Local Development Department. No firm line could be drawn between the responsibilities of the two agencies. However, The Department of Irrigation has agreed to take up projects covering an area of at least 50 ha. The Department of Soil and Water Conservation is a relatively new agency and its activities are mainly conservation measures, such as canal repair and retreading of terraces.

All three agencies are short of professional manpower, so survey and design works are usually done by local and expatriate consultants, hired by the departments. The Irrigation Department works in four development regions through four separate regional directorates. The Local Development Department

works in three regions through three regional offices, while the central region is looked after by the central office itself. The Soil and Water Conservation Department will work through its catchment conservation offices in the three catchments under this Resource Conservation and Utilization Project.

Efforts have been made to allocate responsibility for execution of projects consistent with the general responsibilities of different line agencies. So about six projects, which have an area about 50 ha or over, has been assigned to The Irrigation Department. Twelve other minor improvement schemes are to be executed by DSWC. LDD shall undertake 20 new improvement schemes. The water management of each scheme shall also be looked after by the implementing agency, which takes up the irrigation project.

The proposed RCUP organization has been presented in a chart (Figure I) showing all internal relationships.

Operation and Maintenance

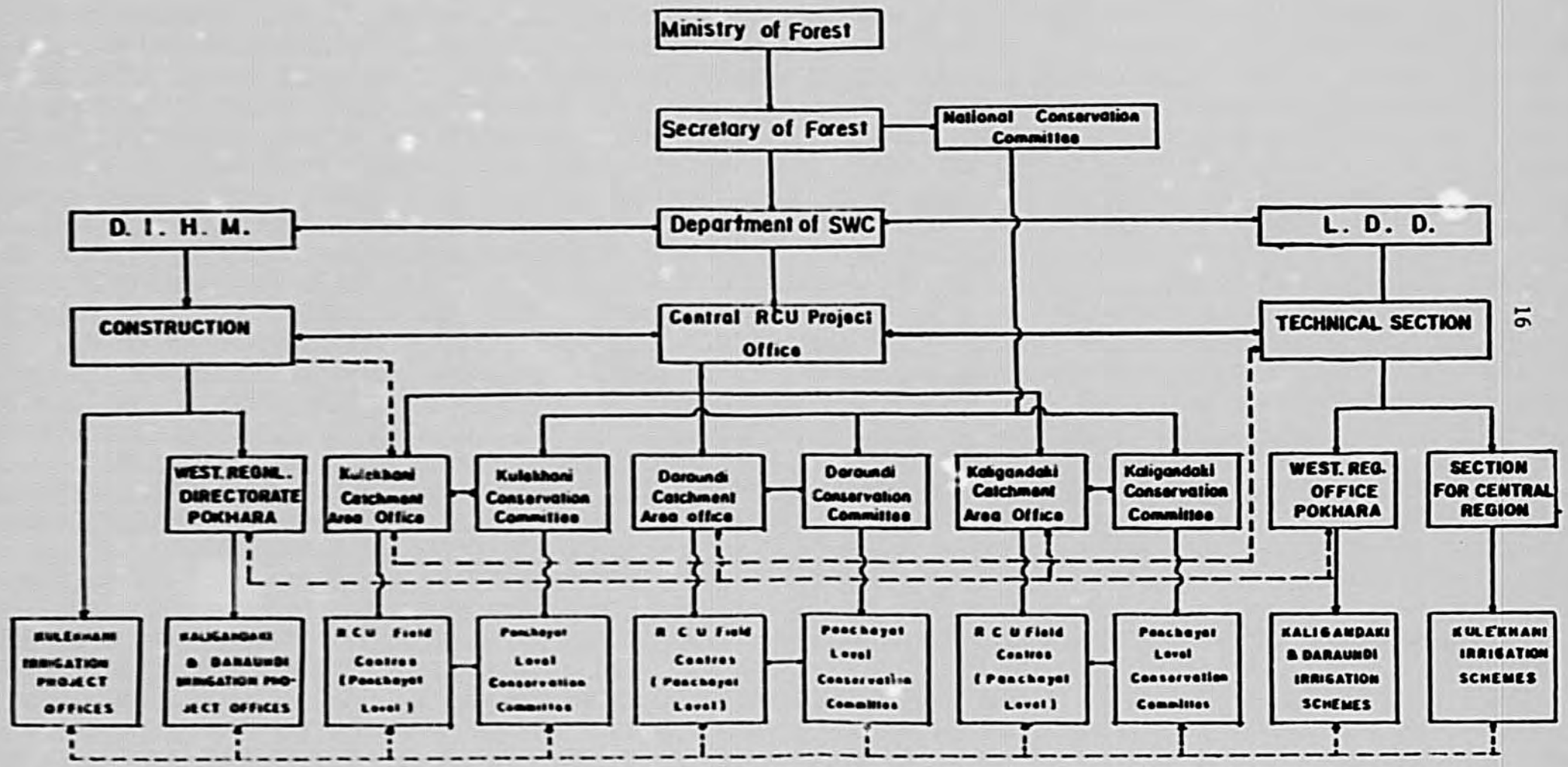
Almost all of the existing systems are maintained by farmers themselves, except for some that are maintained by The Irrigation Department. On the average, about 800 mandays are spent each year in repairing canals. Only major repairs or extensions are looked after by LDD or DIHM, when the agencies are requested to do so by the farming community. Once a minor irrigation project is installed, it would be appropriate to turn them over to villagers for operation and maintenance. It is recommended that the turnover should be made to the concerned Panchayat. The maintainence and operation thus could be effected by a representative body selected by the farmers themselves, in the Panchayat.

Manpower Needs

The professional and subprofessional manpower needed for the execution of projects is presented in a table below. The total requirement for five years has been estimated at 15 manyears of professional and 27 manyears of subprofessional manpower. Nine professional and 18 subprofessional manyears

PROPOSED ORGANIZATION FOR IRRIGATION SCHEME CONSTRUCTIONS

Resource Conservation and Utilization Project



would be available in DIHM and D.S.W.C. Thus additional manpower is required only in L.D.D. These needs relate only to supervision staff and excludes manpower for detailed design works.

PROFESSIONAL AND SUBPROFESSIONAL MANPOWER (MAN MONTHS)

Year	D.I.H.M.		L.D.D.		D.S.W.C.		Total	
	Eng.	Ov.Sr	Eng.	Ov.Sr	Eng.	Ov.Sr	Eng.	Ov.Sr
1st	--	--	--	--	--	--	--	--
2nd	12	24	29	51	24	44	85	110
3rd	18	24	26	52	26	32	70	108
4th	6	12	28	44	12	36	62	92
5th	6	12	11	14	12	24	29	50

Local Labor Mobilization

A summary of local labor mobilization is presented in the table below. No problems are expected in providing unskilled labor, but masons, carpenters, plumbers, and blacksmiths will have to be hired from neighboring areas.

LOCAL LABOR MOBILIZED (MAN DAYS)

Catchment	Labor		
	Skilled	Unskilled	Total
Kulekhani	3,400	25,600	29,600
Daraundi	14,500	98,200	112,700
Upper Kaligandaki	19,800	108,000	127,800
Total	37,700	231,800	269,500

Training

Higher Level. Short term orientation courses will be organized for engineers engaged in RCUP to make them familiar with the techniques to be adopted in combating soil erosion and other conservation problems. A tentative figure of 10 to 12 engineers has been proposed for such in-service training in the first five years.

Middle Level. Middle-level technicians trained in a limited course in Nepal are expected to work satisfactorily, under suitable professional surveillance. However, orientation programs will be organized to make them familiar with the importance of soil conservation measures and techniques.

Low-Level. Tradesmen such as masons, carpenters and plumbers are scarce. Masons and carpenters could be mobilized from some adjoining areas. But plumbers will have to be trained. Some 25 plumbers will be trained over five years. Plumbers for the irrigation component may need somewhat different training from the training meant for the water-supply component because relatively large-diameter pipes will be used for irrigation.

Design Criteria

It is recommended that a detailed design report of an irrigation scheme should include the following:

Topographic Survey. A general layout map and other necessary base maps must be prepared for the project. A general geological description and recommendations for construction methods shall be prepared.

Appraisal of Land Resources. The extent of total land area and irrigable areas shall be ascertained, as well as what is needed for the improvement and maintenance of soil fertility. Soil and water tests shall be carried out.

Agricultural Studies. Present cropping patterns and suggested new patterns shall be broadly discussed.

Appraisal of Water Resources. Crop water requirements shall be worked out for engineering design purposes and the capacity of the source assessed.

Irrigation and Drainage Engineering. Engineering designs shall be prepared on (1) extraction and conveyance of water and (2) distribution and drainage of water.

Specific detailed recommendations with working drawings for good distribution and drainage, such as correction of slopes of terraces and land leveling shall also be prepared.

Cost Estimate. A detailed cost estimate of the project shall be prepared.

Economics. A benefit-cost ratio and internal rate of return shall be established for assessing economic feasibility.

Conclusion

More irrigation schemes can be identified when conditions exist which permit the use of more sophisticated technology and facilities. At present, only simple gravity flow has been considered.

The most important component of an irrigation system from the point of view both of conservation and production, is the distribution and management of water. Due attention should be paid to this component in both design and implementation stages of this project.

The selection at, and assignment of, priority to irrigation schemes should be determined on the basis of technical and economical appraisals. Local representatives should be asked to participate in the appraisal of a large number of projects. The government policy of entrusting the selection and priority rating of schemes to District Panchayats may lead to undesirable results.

There are more irrigable areas in the regions under study. But starting with simpler irrigation schemes and moving gradually to more complex ones will ensure success in implementation of various irrigation schemes.

ATTACHMENT 1.1.1

COST SUMMARY OF IRRIGATION COMPONENT

A. Project Construction Cost

		Local Currency (NRS x 100)	Foreign Currency (NRS x 1000)
1.	Kulekhani Catchment	764.0	552.0
2.	Daraundi Catchment	2546.8	1844.2
3.	Kaligandaki Catchment	4231.7	3064.3
	Subtotal	7542.5	5460.5

B. Engineering

1.	Kulekhani Catchment	197.0	
2.	Daraundi Catchment	659.0	
3.	Kaligandaki Catchment	1094.0	
	Subtotal	1950.0	

C. Training

1.	Inland	150.0	

D.	Tools/Equipment	400.0	1600.0
	Subtotal	550.0	1600.0
	Total	10042.5	7060.5
	GRAND TOTAL (NRS x 1000)	17103	

ATTACHMENT 2.1.2

FINANCIAL OUTLAY FOR LINE AGENCIES

(Project Construction & Engineering Cost)

Year	Irrigation Department	Local Development Department	Soil and Water Conservation Department
1st Year	563.0	1003.0	384.0
2nd Year	1393.0	2027.0	536.0
3rd Year	1430.0	2346.0	525.0
4th Year	526.0	1820.0	850.0
5th Year	408.0	496.0	646.0
Subtotal	4320.0	7692.0	2941.0

Remarks: All engineering costs have been allocated in the first year. The costs do not include physical contingencies.

ATTACHMENT 3.1.3

SUMMARY ON PROPOSED IRRIGATION SCHEMES--KULEKHANI

S.No.	Panchayat	Village	Total Irrigable Area ha	Source Proposed	Estimated Minimum Discharge of Source lft/sec	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Sisneri	Silikot	7	Changthun	20	95	13571	Piped Supply
2	Ipa-ukhubari (5,6,4)	Ipa-ukhubari	40	Kogate Khola	56	563	14075	Partially Pipe Supply

SUMMARY ON ORRIGATION IMPROVEMENT SCHEMES

1	Tistung Thahachowk	Thahachowk	19	--	50	220	12000	
2	Bhimphedi	Suping	6	Gotrakhe Khola	10	100	16666	
3	Palung	Palung	30	Rikheswor Khola	40	330	11000	

ATTACHMENT 3.2.4

SUMMARY ON PROPOSED IRRIGATION SCHEMES--DARAUNDI

S.No	Panchayat and Wards	Village	Total Irrigable Area ha	Source Proposed	Estimated Minimum Discharge of Source lft/sec	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Muchhok	Muchhok Tar	30	3 Nearby Rivulets	40	461	15366	
2	Deurali	Karam Singhkhet	10	Chadi Khola	30	179	17900	
3	Dhuwakot	Besi Phant	74	Chukti Khola	30	722	9756	
4	Jaubari	Bhansar	40	Syangdi Khola	25	643	16075	
5	Barpak	Barpak	30	Chhiga Khola		420	14000	
6	Harmi	Mallatar	100	Khar Khola		835	8350	

SUMMARY ON IRRIGATION IMPROVEMENT SCHEMES

1	Ammppipal (5,6,9)	Simpani	15	Budhi Khola Mungri Khola	20	78	5200	
2	Choprak	Chorkate Tar	50	Bhusundi Khola		558	11160	
3	Simjung	Jhyawa	40	Jhyalla-Kaule Kholas	35	213	5325	
4	Muchhok Tar (bank of Daraundi)	Muchhok Tar	30	Jhyalla Khola	35	282	9400	One Season Only

ATTACHMENT 3.1.3

SUMMARY ON PROPOSED IRRIGATION SCHEMES--KULEKHANI

S.No.	Panchayat	Village	Total Irrigable Area ha	Source Proposed	Estimated Minimum Discharge of Source lft/sec	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Sisneri	Silikot	7	Changthun	20	95	13571	Piped Supply
2	Ipa-ukhubari (5,6,4)	Ipa-ukhubari	40	Kogate Khola	56	563	14075	Partially Pipe Supply

SUMMARY ON ORRIGATION IMPROVEMENT SCHEMES

1	Tistung Thahachowk	Thahachowk	19	--	50	220	12000	
2	Bhimphedi	Suping	6	Gotrakhe Khola	10	100	16666	
3	Palung	Palung	30	Rikheswor Khola	40	330	11000	

ATTACHMENT 3.2.4

SUMMARY ON PROPOSED IRRIGATION SCHEMES--DARAUNDI

S.No	Panchayat and Wards	Village	Total Irrigable Area ha	Source Proposed	Estimated Minimum Discharge of Source lft/sec	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Muchhok	Muchhok Tar	30	3 Nearby Rivulets	40	461	15366	
2	Deurali	Karam Singhkhet	10	Chadi Khola	30	179	17900	
3	Dhuwakot	Besi Phant	74	Chukti Khola	30	722	9756	
4	Jaubari	Bhansar	40	Syangdi Khola	25	643	16075	
5	Barpak	Barpak	30	Chhiga Khola		420	14000	
6	Harmi	Mallatar	100	Khar Khola		835	8350	

SUMMARY ON IRRIGATION IMPROVEMENT SCHEMES

1	Ammppipal (5,6,9)	Simpani	15	Budhi Khola Mungri Khola	20	78	5200	
2	Choprak	Chorkate Tar	50	Bhusundi Khola		558	11160	
3	Simjung	Jhyawa	40	Jhyalla-Kaule Kholas	35	213	5325	
4	Muchhok Tar (bank of Daraundi)	Muchhok Tar	30	Jhyalla Khola	35	282	9400	One Season Only

ATTACHMENT 3.3.5

SUMMARY ON PROPOSED IRRIGATION SCHEMES--KALIGANDAKI (MYAGDI)

S.No.	Panchayat and Wards	Village	Total Irrigable Area ha	Source Proposed	Estimated Minimum Discharge of Source l/Sec	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Ghatan (5)	Thakan Mulbari Marsikhet	45	Pandela	28	503	11177	
2	Beg Khola (1,6)	Kapal Danda Beg Gaon	30	Utsini Tanakhu	30	267	8900	
3	Baraha (6,7)	Narchang	16	Kibang	Sufficient	166	10375	
4	Doba (9)	Bhurung Tatopani	10	Tatopani Chahara	20	162	16200	

No improvement irrigation schemes were identified in Myagdi District.

ATTACHMENT 3.3.5

SUMMARY ON PROPOSED IRRIGATION SCHEMES--KALIGANDAKI (MYAGDI)

S.No.	Panchayat and Wards	Village	Total Irrigable Area ha	Source Proposed	Estimated Minimum Discharge of Source l/Sec	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Ghatan (5)	Thakan Mulbari Marsikhet	45	Pandela	28	503	11177	
2	Beg Khola (1,6)	Kapal Danda Beg Gaon	30	Utsini Tanakhu	30	267	8900	
3	Baraha (6,7)	Narchang	16	Kibang	Sufficient	166	10375	
4	Doba (9)	Bhurung Tatopani	10	Tatopani Chahara	20	162	16200	

No improvement irrigation schemes were identified in Myagdi District.

ATTACHMENT 3.3.6

SUMMARY ON PROPOSED IRRIGATION SCHEMES--KALIGANDAKI (MUSTANG)

S.No.	Panchayat and Wards	Village	Total Irrigable Area ha	Source Proposed	Estimated Minimum Discharge of Source l/Sec.	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Kowang (1,2,3,4,9)	Khangiphat	40	Chhiplung Khola	59	619	15475	
2	Lete (3)	Siranghasa	22.5	Kamdhenu Khola	168	376	16711	
3	Chusang (7)	Chaile	30	Ghyakar Khola	114	569	18966	
4	Kagbeni (1)	Santar	15	Dhunga Karma Spring	60	313	20866	
5	Marpha (9)	Mugophant	20	Pamkiu Khola	Sufficient	368	18400	
6	Tukche (1)	Thiling	8	Thapa Khola	Sufficient	125	15625	
7	Kunjo (4,5,6)	Kunjo	10	Chhanga Khola Tarlen, Pangbu	56	202	20200	

ATTACHMENT 3.3.7

SUMMARY ON IRRIGATION IMPROVEMENT SCHEMES--KALIGANDAKI (MUSTANG)

S.No.	Panchayat and Wards	Village	Total Irrigable Area	Source Proposed	Estimated Mimimum Discharge of Source l/sec	Estimated Cost 000'N.Rs.	Cost per ha of Irrigated Area NRS	Remarks
1	Chhonup (3,4)		26	Sya Khola	--	145	5576	
2	Chhonup (5,6)	Kimling	50	Sya Khola	150	526	10520	
3	Surkhang (3,4)	Yara	6	Tase Khola	20	98	16333	
4	Lhomanthang (3,4)	Mustang	40	Jyang Dhokpa	117	539	13475	
5	Lhomanthang (1-8)	Mustang	66	Jyang Dhokpa	117	708	10727	
6	Ghami (1,2,3,4)	Ghilung	16	Tamang Khola	42	144	9000	
7	Ghami (8,9)	Dhakmar	50	Mulumba Khola	42	408	8160	
8	Ghami	Ghilung	6	Chu Kunang/Spring	9	62	10333	
9	Charang	Mathilo Gaon	40	Charang Khola	130	375	9375	
10	Charang (1,2,3)	Marang	20	Marang Khola	360	167	8350	
11	Surkhang	Dhi	10	Dhi Khola	28	183	18300	
12	Charang	Tallo Gaon	45	Charang Khola	104	271	6022	

ATTACHMENT 4.1.8

PROJECTS TO BE IMPLEMENTED BY IRRIGATION DEPARTMENT--DARAUNDI
1979-84

Panchayat and (Wards)	Village	Area Irrigable (ha)	Total Cost 000'N.Rs.
		2nd Year	
1 Harmi	Mallatar	100	835
2* Choprak	Chorkatetar	50	558
	Subtotal	150	1393
		3rd Year	
1 Dhuwakot	Besi Phant	74	722
		4th Year	
No program foreseen further.		--	--
	GRAND TOTAL	224	2115

*improvment scheme.

Note: No schemes foreseen in Kulekhani Catchment under Irrigation Department.

ATTACHMENT 4.2.9

PROJECTS TO BE IMPLEMENTED BY IRRIGATION DEPARTMENT--KALIGANDAKI
1979-84

Panchayat and (Wards)	Village	Area Irrigable (ha)	Total Cost 000'N.Rs.
		2nd Year	
No projects in the Catchment			
		3rd Year	
1* Lhomanthang	Mustang	66	708
		4th Year	
2* Chhonup	Kimling	50	526
		5th Year	
3* Ghami	Dhakmar	50	408
	GRAND TOTAL	166	1642

*All projects are existing irrigation systems which need attention, and the costs estimated are improvement costs.

ATTACHMENT 5.1.10

PROJECTS TO BE IMPLEMENTED BY LOCAL DEVELOPMENT DEPARTMENT--KULEKHANI

Panchayat and (Wards)	Village	Area Irrigable ha	Total Cost 000'N.Rs.
		2nd Year	
1* Tistung Thahachok	Thahachok	19	228
2 Sineri	Silikot	7	95
3* Bhimphedi	Suping	6	100
	Subtotal		423
		3rd Year	
1 Ipa-ukhubari	Ipa-ukhubari	40	563
	Subtotal		563
		4th Year	
No schemes.			
		5th Year	
1* Palung	Palung	30	330
	Subtotal		1316

*These schemes are existing schemes in operation which need specific improvements, and the costs shown are the costs of improvements of these schemes.

ATTACHMENT 5.2.11

PROJECTS TO BE IMPLEMENTED BY LOCAL DEVELOPMENT DEPARTMENT--DARAUNDI
1979-84

Panchayat and Wards	Village	Area Irrigable ha	Total Cost 000'N.Rs.
		2nd Year	
1 Barpak	Barpak	30	420
		Subtotal	420
2 Muchhok Tar	Upland Village	30	461
		Subtotal	461
		3rd Year	
1 Jaubari	Bhansar	40	643
2 Deurali	Karamsinghkhet	10	179
		Subtotal	822
		4th Year	
No schemes.			
		GRAND TOTAL	1703

ATTACHMENT 5.3.12

PROJECTS TO BE IMPLEMENTED BY LOCAL DEVELOPMENT DEPARTMENT--KALIGANDAKI
1979-84

Panchayat and Wards		Village	Area Irrigable ha	Total Cost 000'N.Rs.
			2nd Year	
1	Kagbeni	Santak, Thakan	15	313
2	Ghatan	Mulbari (Marsi Khet) (Eklekhet)	45	503
3	Marpha	Mugophant	20	368
		Subtotal	80	1184
			3rd Year	
1	Kowang	Phangiphant	40	619
2	Lete	Siran Ghara	22	376
3	Kunjo	Kunjo	10	202
4	Tukchhe	Thilling	8	125
		Subtotal	80	1322
			4th Year	
1	Doba	Bhurung Tatopani	10	162
2	Chusang	Chaile	30	569
3	Beg Khola	Kaphal Danda Beg Gaon	30	267
		Subtotal	70	998
			5th Year	
1	Baraha	Marchyang	16	166
		Subtotal	16	166
		GRAND TOTAL	246	3670

ATTACHMENT 6.1.13

PROJECTS TO BE IMPLEMENTED BY
SOIL AND WATER CONSERVATION DEPARTMENT--DARAUNDI
1979-84

Panchayat and Wards	Village	Area Irrigable ha	Total Cost 000'N.Rs.
		2nd Year	
1* Amppipal	Simpani	15	78
2* Simjung	Jhyawa	40	213
	Subtotal	55	291
		3rd Year	
1* Muchhok	Bank of Daraundi	30	282
		4th Year	
No program foreseen further in catchment by D.S.W.C.			
	GRAND TOTAL	85	573

*All schemes are improvement schemes.

ATTACHMENT 6.2.14

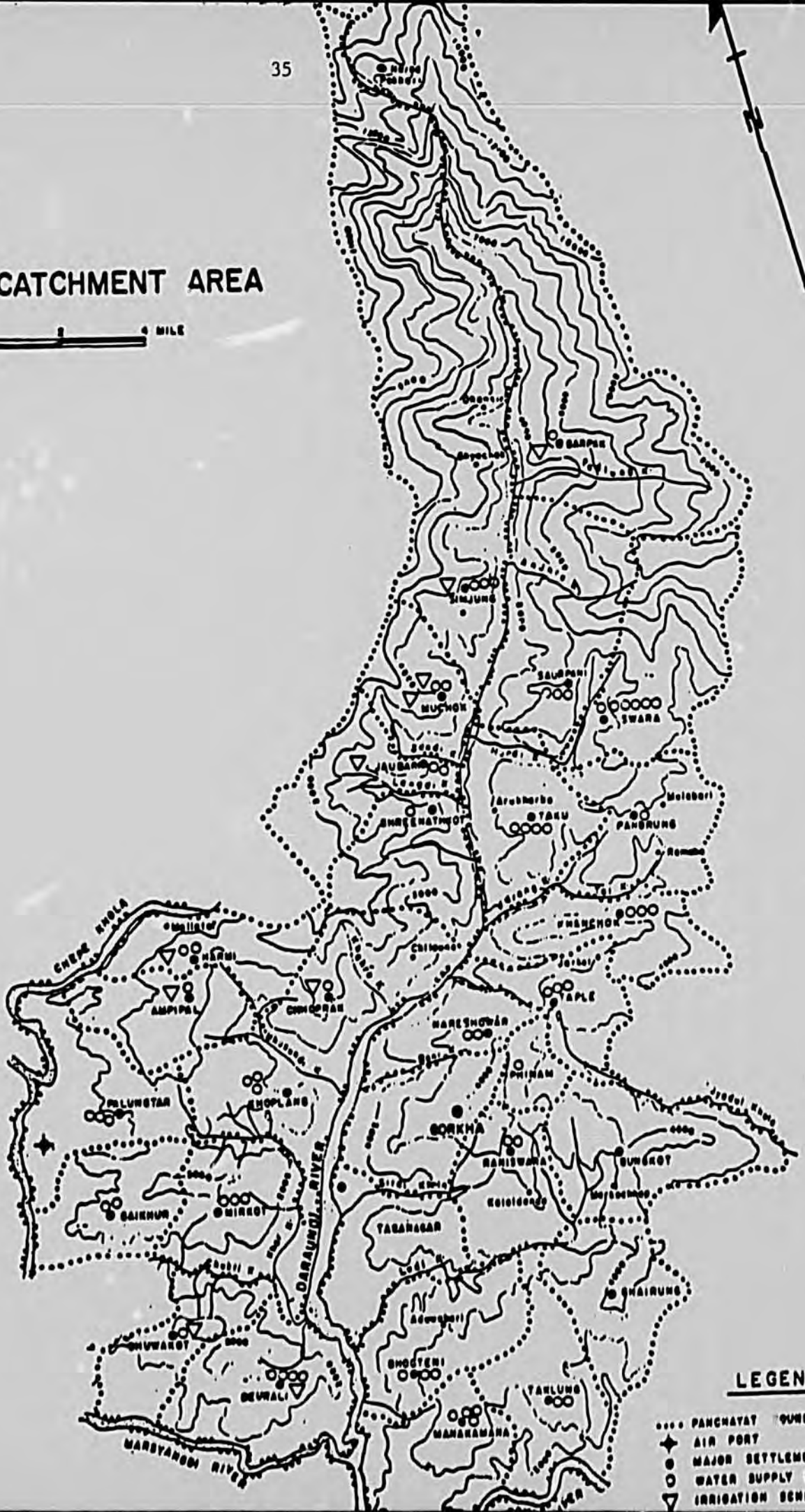
PROJECTS TO BE IMPLEMENTED BY
SOIL AND WATER CONSERVATION DEPARTMENT--UPPER KALIGANDAKI
1979-84

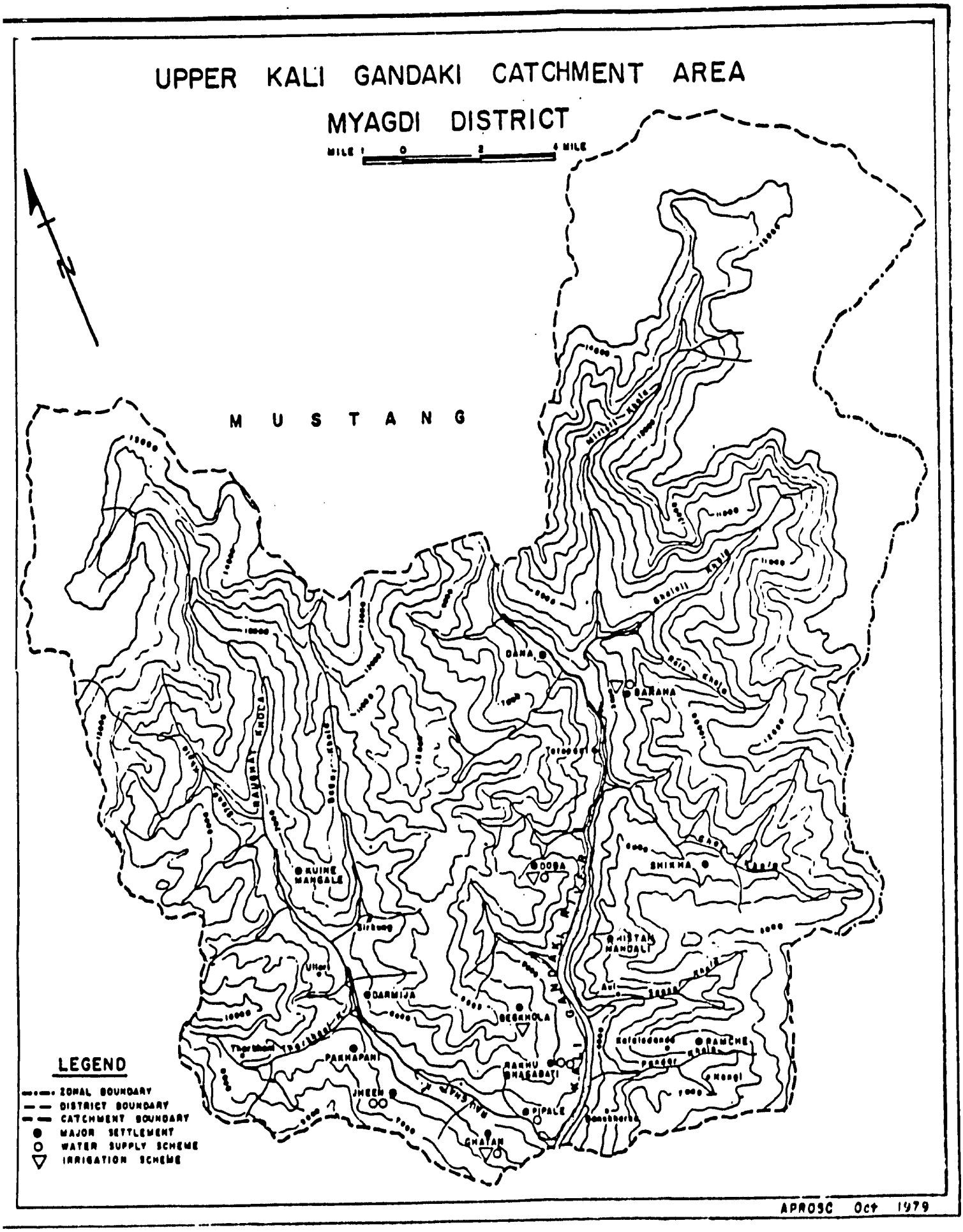
Panchayats and Wards	Village		Area Irrigable ha	Total Cost 000'N.Rs.
			2nd Year	
1* Surkhang	Dhi		10	183
2* Ghami	Ghilung		6	62
		Subtotal	16	245
			3rd Year	
1* Surkhang	Yara		6	98
2* Chhonup (3,4)	--		26	145
		Subtotal	32	243
			4th Year	
1* Lhomanthang (9)			40	539
2* Ghami	Ghilung		16	144
3* Charang	Marang		20	167
		Subtotal	76	850
			5th Year	
1* Charang	Mathillo Gaon		40	375
2* Charang	Tallo Gaon		45	271
		Subtotal	85	646
		GRAND TOTAL	209	1984

*All projects are existing schemes and the costs shown are improvement costs.

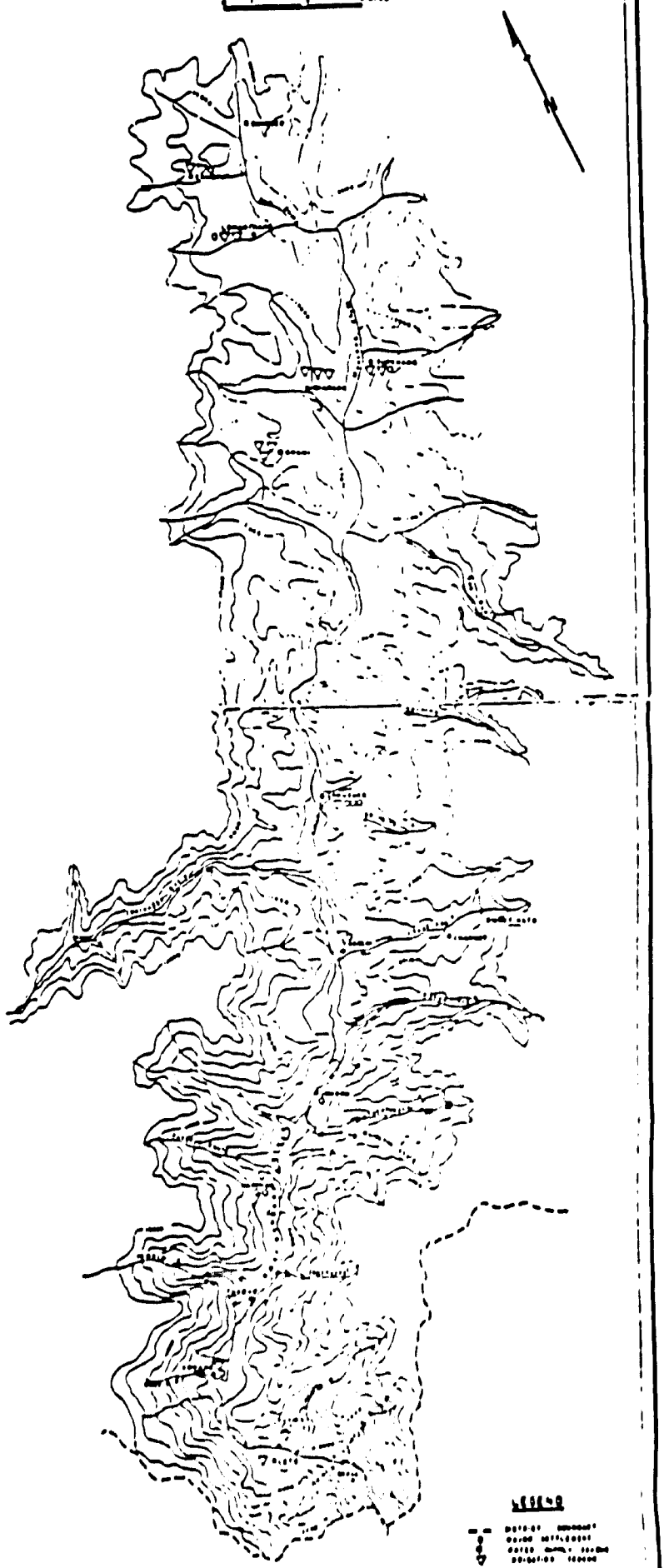
KULEKHANI CATCHMENT AREA

DARAUNDI CATCHMENT AREA




UPPER KALI GANDAKI CATCHMENT AREA
MYAGDI DISTRICT
MILE 1 0 2 4 MILE
N
MUSTANG
DANA
BARAHA
DOBA
SHIKHA
KUINE MANGALE
DARMIJA
BEGHKOLA
PAKHAPANI
JHEEN
PIPALE
GHATAN
RAMCHE
LEGEND
ZONAL BOUNDARY
DISTRICT BOUNDARY
CATCHMENT BOUNDARY
MAJOR SETTLEMENT
WATER SUPPLY SCHEME
IRRIGATION SCHEME
APROSC Oct 1979

UPPER KALI GANDAKI CATCHMENT AREA
MUSTANG DISTRICT



APPENDIX H

WATER SUPPLY COMPONENT

Prepared by: APROSC

TABLE OF CONTENTS

		Page
Summary		1
List of Attachments		
Section		
1.	Introduction	3
2.	Field Methods	4
3.	Existing Situation	4
4.	Strategies for Project Implementation	6
5.	Proposed Population Coverage	6
6.	Implementation Programme	9
7.	Priorities	11
8.	Investment Needs	12
9.	Implementing Agencies	15
10.	Operation and Maintenance	16
11.	Minimum Professional and Sub-Professional Manpower Needed	16
12.	Local Labor Mobilization	17
13.	Training Needs	18
14.	Design Criteria	19
15.	Conclusions	20

List of Attachments

1. Existing Water Supply Situation

Kulekhani	1.1.1
Daraundi	1.2.2
Kaligandaki	1.3.3

2. Total Water Supply Coverage of Present Population Coverage

Kulekhani	2.1.4
Daraundi	2.2.5
Kaligandaki	2.3.6

3. Implementation Programme

Kulekhani	3.1.7
Daraundi	3.2.8
Kaligandaki	3.3.9

4. Financial Outlay for Water Supply Construction 4.0.10

5. Financial Allocation

Kulekhani	5.1.11
Daraundi	5.2.12
Kaligandaki	5.3.13

6. Minimum Professional & Sub-professional Manpower Needs for Water Supply Construction 6.0.14

7. Construction Labour Requirement

Kulekhani	7.1.15
Daraundi	7.2.16
Kaligandaki	7.3.17

8. Summary on Proposed W/S Schemes

Kulekhani	8.1.18
Daraundi	8.2.19
Project Studied under IRDP Gorkha	8.2.20
Kaligandaki	8.3.21

RCU PROJECT

WATER SUPPLY COMPONENT

SUMMARY

The RCU study indicates that the existing water supply situation in all of the 3 catchment areas is seriously inadequate. A large part of the population is deprived of piped water facilities and must rely on local seepage wells, streams, irrigation channels and springs. In addition, unhygienic practice of the local inhabitants has caused degradation of water quality. Moreover the rapidly disappearing vegetation has reduced the flow of water, making the water supply itself inadequate. As there is simultaneously an increasing demand for more water due to population increase, this problem is further aggravated.

At present, 14.4 percent of the population in the Kaligandaki area is provided with piped drinking water facilities, which is the highest coverage in the project area. This is followed by Kulekhani where 9.3% of the people have piped drinking water; and the lowest of all is Daraundi, where this facility is available to only 4.4% of the population. When compared with the expected national average figure of 10% for 1980, only the figure for the Daraundi catchment appears low, but the water supply situation in the other areas is also very inadequate.

A piped water supply is considered both a basic need and a necessary condition for improved rural health. At the same time, accessible water would relieve each family of hours of time spent each day in the collection of water. This could free existing manpower for more productive work. Thus better health and more productive use of time of the population in these areas would not only conserve human resources but could also lead to better utilization of other resources.

The lack of developed infrastructural facilities combined with the generally poor economic condition of the project areas will require that water be supplied through the simplest technology and initially at a low service level. Thus the proposed RCUP scheme mainly aims to transport water from the best available (yet distantly and inconveniently located) sources to points nearer to the villages and to distribute this water through public taps.

In all, 82 water supply schemes are included under the RCUP program, of which 47 will be in Daraundi, 15 in Kulekhani and 20 in the Kaligandaki basin. During the first 5 years of the project, 49 of these schemes will be constructed in order of their economical and technical merit.

The construction program of the first 5 years is arranged in concurrence with the 6th 5 year national plan (1980-85). According to HMG's ten-year water supply program, drinking water facilities will be provided to 27 percent of the

rural hill population by the end of the 6th plan period, and to 44 percent of this population by the end of the 7th plan period. However, the RCUP water supply construction program does not plan to cover the same percentage of population as set in the government's ten year program. Rather a total of 18.2 percent of the population in Kulekhani, 31.1 percent in Daraundi and 28.3 percent in Kaligandaki will be covered by RCUP water supply schemes in the first 5 years. The total population coverage at the end of a 10 year RCUP program will be 89.5 percent in Kulekhani, 37.9 percent in Daraundi and 29.1 percent in Kaligandaki.

Although the government's target population for the 7th 5-year plan is determined, the actual number of schemes to be undertaken is not yet known. Moreover, the number of water schemes so far identified will not be enough to meet the target of the 7th plan. As for the schemes envisaged under RCUP, once the first 5 year targets have been met, the remaining schemes will be immediately undertaken.

The total cost for implementing the proposed RCUP schemes is estimated at Rs. 1,46,10,600/- and is broken down as follows:

Project construction cost	Rs. 124,70,600.00
Engineering cost	Rs. 10,40,000.00
Inland training cost	Rs. 1,00,000.00

The catchment area wise allocation is:

Kulekhani	Rs. 16,63,200.00
Daraundi	Rs. 93,26,500.00 and
Kaligandaki	Rs. 26,20,900.00 (excluding the tools and equipment cost).

The outlay in each five year is:

1st 5 year	Rs. 1,07,48,500.00 and
2nd 5 year	Rs. 28,62,100.00, out of which

Rs. 42,91,400.00 and Rs. 15,52,800.00 will be required in foreign currency for the two respective five-year periods.

Both the Department of Water Supply and Sewerage (WSSD) and the Local Development Department (LDD) will be responsible for implementing the rural water supply schemes under the RCU Project. The Department of Water Supply and Sewerage (under the Ministry of Water, Power and Irrigation) will be implementing a total of 12 schemes that each cover areas with more than 1500 people. The remaining 70 schemes, each covering a population of less than 1500, will be implemented by the Local Development under the Ministry of Home and Panchayat. Local panchayats will be made responsible for the maintenance of the schemes.

Since the scale and the extent of the present program fits into the national program, a separate provision for professional and sub-professional person power is not needed. The required person years of engineers and overseers will be 38 and 98 respectively, which will be supplemented from the departmental cadre. Provision for in-service training to departmental technicians has been made in the RCUP program. To install and maintain the RCUP schemes provision for training in plumbing will also be made.

I. Introduction

Adequate, safe and reasonably accessible water is a pressing need of the rural population in the project areas. Each year, a growing population combined with depleting water resources is making the availability of drinking water an increasing problem. The shortage of potable drinking water, in turn, is contributing to the continual degradation and depletion of other resources.

A piped water supply conveying water from a distantly located source and distributing it through conveniently located public taps would greatly save each family a considerable number of work hours per day. A piped water supply is also a necessary condition for improved rural health. It is easy to see the contribution of a piped water supply, providing adequate and relatively safe water for domestic cleaning and consumption, will considerably save time lost from work due to illness in a villagers' productive lifetime.

Most villagers in the project areas are forced to meet their water needs for human and livestock consumption directly from natural water sources. This practice both contaminates and degrades the water sources. In addition, due to the distance of the water sources, stall watering and, by extension, feeding of livestock is discouraged, resulting in a pattern of haphazard grazing which in turn, undermines land and soil preservation.

It is partly because of the integral relation between drinking water supplies and land/soil conservation that a water supply component has been incorporated in the RCU program. In the present study, an attempt was made to determine: (1) What proportion of the population in the project areas is presently benefitted by a piped supply? (2) What is the population percentage to be covered by any schemes presently under construction? (3) How much of the population could be covered by a water system that uses the simple principle of gravity? (4) What would be the actual benefits of improved

water supplies?

This report does not contain a detailed description of the individual water schemes identified during field work. Any concerned agency or other interested individuals is advised to go through inventory and design forms.[1/]

2. Field Method

The proposed schemes reflect community demand as assessed by technicians during their field visits to the panchayats in the project areas. Besides collection of information on existing water supplies in the panchayats, a preliminary survey of each area was conducted. This preliminary survey covered data on current supply area, water demand, and an estimation of source discharge. Except in some rare cases, the source and supply area for the new water projects was suggested by community members.

Each visiting team consisted of two civil overseers. Each team visited 5 to 6 panchayats in each of the project areas. In general the survey and other fieldwork in each panchayat lasted for 2 to 3 days. The fieldwork was supervised by an experienced sanitary engineer. Prior to field visits the field technicians were given an orientation course on the objectives of the study, theoretical background of the subject matter, and practical techniques of investigation and surveying.

Fieldwork first began in the Kulekhani catchment area (January 1979), then in Daraundi (March-April) and finally in Kaligandaki (May-June). At the time of the survey, the water source yield in Kulekhani was at the beginning of depletion and in Daraundi it was about to reach its minimum level. In the southern Kaligandaki catchment area, the water source yield was at its minimum whereas the northern part of the catchment area, it was at high flow due to melting snow from higher altitudes. These conditions were, of course, considered in evaluating source potentials.

A number of potential water schemes had already been surveyed by other agencies. An attempt was made to identify these schemes from the concerned agencies, but the list remained incomplete. But wherever a well documented report was made available by any of the agencies, these planned water schemes were included in the RCUP list of water projects to be constructed.

3. Existing Water Supply Situation

Most of the existing water used by villagers in the project areas comes

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1/ These inventory and design forms will be made available to the implementing line agencies.

from open streams and channel courses, seepage wells and springs. The population reached by piped water facilities is minimal, with the highest coverage of 14.4% in the Kaligandaki catchment.

There are three factors that individually and collectively make the rural water supply problem acute: (1) Low quality of source water (2) Low quantity of flow (3) Inconvenient location of the sources. The association of the first factor with health problems cannot be overemphasized. But the latter two factors serve to restrict water use to bare essentials--i.e., to drinking and cooking. Thus very little water is left for household hygiene. This problem becomes more acute during the dry period when most of the sources either dry up or their flow is minimal.

The following table summarizes the existing situation in the project areas based on the projected population of 1979. (For panchayat-wise details see Attachment 1.1.1, 1.2.2. & 1.3.3).

Table 1

Population Covered by Piped Water Supply

	Catchment	Total Population	Percent	Population Covered
1.	Kulekhani	37,791	9.3%	3,506
2.	Daraundi[2/]	1,32,009	4.4%	5,824
3.	Kaligandaki[2/]	54,249	14.4%	7,819

As the above table shows, the highest population coverage is in the more remote Kaligandaki catchment. Probable reasons for this are (1) that a number of schemes in nearby villages, enroute in the busy Pokhara-Jomsom tourist trek, have been implemented through foreign aid and private agencies. (2) The annual government grants to districts are mostly diversed to rural water supply. Since equal grants are given to each district irrespective of population size, areas of low population, such as Mustang District (upper Kaligandaki), have a

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2/ The percentage population coverage shown differs from the figure in the Table for Existing Situation (At 1.1.1, 1.2.2 & 1.3.3). Complete data on some of the panchayats not being available, it has been assumed that the missing panchayats do not have a piped supply.

higher percentage of population covered by water systems. (3) That the government agencies, too, are giving development priority to these remote areas.

Kulekhani, the next highest area of piped water population coverage, is favoured by its proximity to Kathmandu. Daraundi catchment, with the lowest coverage, is deprived of any of the development benefits of the other two areas.

4. Strategies for Project Implementation

As already indicated, the RCUP strategy to implement piped water would be to channel the best available water source to more convenient access points in the rural community. Provision of indoor supplies has been discarded since the installation and maintenance operations would be both complicated and costly. Similarly, no chemical treatment of the water is proposed. Even the simplest treatment (Chlorination) would not bring health benefits until other community living conditions and health practices improve.

The water system design and construction is to be as simple and as durable as possible. Highest preference will be given to the use of locally available material and labor. Many schemes can be supplied that only use gravity and require no other energy. Implementation of schemes requiring mechanical power is to be delayed until a suitable technological infrastructure prevails. Simple water-lifting devices, such as the hydraulic ram installed in many rural Nepalese communities, have proven to be short-lived because of the lack of available skilled mechanics.

At present, while a large part of the population in the project area still suffers the problem of water accessibility, it is proposed to extend minimal services to more and more people instead of focusing investment in a few high quality schemes. This latter approach would be neither adaptive to the rural environment nor to the economic condition of the country.

5. Proposed Population Coverage

His Majesty's Government has recently approved a ten-year (1980-90) plan for the provision of drinking water in Nepal. The ten year duration covers the 6th and 7th 5-year national plans. According to this plan, existing piped water supply coverage will be improved from 10 percent (1980) to 20 percent and 44% at the end of the 6th and 7th plan periods respectively. Accordingly the number of projects to be implemented during the forthcoming 6th plan is predetermined (see Table 3). This plan has been an important

guideline in setting targets for the present project. (See "Implementation Program".)

The implementation of the RCU water supply schemes will improve the population coverage in the selected areas, exceeding the national target set for the first 5 years, but will be short of the target envisaged for the second 5 years of the ten year national plan. Most of the schemes identified during field work will be implemented during the first 5 years, and only a few schemes will have to be implemented during the second 5 years. But additional schemes may be required as demand increases following changes in community awareness of the benefits of an improved water supply. Accordingly, the project may need revision and extension in the later phases.

The following paragraphs briefly summarize the planned increase in population coverage in each of the project areas. Accompanying tables show the existing population coverage, the proposed coverage and the total coverage at the end of 1979, 1984 and 1989.

The latter part of the report contains tables (See attachment 2.1.4, 2.2.5, and 2.3.6) giving the panchayat-wise population coverage based on the projected population of 1979. The population projections are based on the annual growth rates adopted by WSSD (See Section 14). It was difficult to estimate the population that might be covered by schemes that are already planned for local implementation and so these estimations are excluded from the tables.

5.1 Kulekhani Catchment

At the end of 1979, 10.3 percent of the Kulekhani population would be benefitted from piped water from existing facilities as well as from schemes under construction. During the first 5 years, the RCU Project will benefit 17.9 percent of this population, thus the cumulative population benefitted at the end of 1984 will be 28.2%. An additional population coverage of 1.3 percent during the second 5-year period would then make the total coverage of 29.5 percent at the end of 1989.

Table 2.1

POPULATION BENEFITTED IN KULEKHANI CATCHMENT

Year	Total Population	Benefitted from current coverage		Benefitted from new schemes		Total benefitted at the end	
		Population	%	Population	%	Population	%
1979	37791	3506	9.3	369	1.0	3875	10.3
1984	42757	4373	10.3	7674	17.9	12046	28.2
1989	48376	13630	28.2	616	1.3	14246	29.5

5.2 Daraundi Catchment

In Daraundi catchment, 16.1 percent of the population will be covered during the first 5-year period in addition to the coverage of 15.0 percent which it will obtain at the beginning of the project. The total coverage will be 31.1 percent at the end of 1984. Next, an additional 6.8 percent of the population is proposed to be covered during the next 5 years and total coverage at the end of 10 years will be 37.9 percent.

Table 2.2

POPULATION BENEFITTED IN DARAUNDI CATCHMENT

Year	Total Population	Benefitted from current coverage		Benefitted from new schemes		Total benefitted at the end	
		Population	%	Population	%	Population	%
1979	132009	5824	4.4	13971	10.6	19795	15.0
1984	145738	21854	15.0	23427	16.1	45281	31.1
1989	160895	49990	31.1	11041	6.8	61031	37.9

5.3 Kaligandaki Catchment

At the beginning of the RCUP project, 15.6 percent of the population will be covered by a piped water supply from existing schemes and from those currently under construction. Then, during the first 5 years, the RCUP project will increase this coverage to 28.3 percent. In the next 5 years another .8 percent will be added, making a total of 29.1 percent at the end of the 10-year period.

Table 2.3

POPULATION BENEFITTED IN KALIGANDAKI CATCHMENT

Year	Total Population	Benefitted from current coverage		Benefitted from new schemes		Total benefitted at the end	
		Population	%	Population	%	Population	%
1979	54299	7819	14.4	671	1.2	8490	15.6
1984	59946	9373	15.6	7595	12.7	16968	28.3
1989	66180	18733	28.3	533	0.8	19266	29.1

6. Implementation Program

The table below shows the number of schemes that His Majesty's Government plans to construct during the forthcoming 6th plan period in those districts covered partially or fully by the 3 catchment areas.

Table 3

	Catchment	District	No. of Schemes Large	Small	Total
1.	Kulekhani	Makwanpur	10	18	28
2.	Daraundi	Gorkha	10	16	26
3.	Kaligandaki	Mustang	6	15	21
		Myagdi	6	16	22
		Total	32	65	97

This table only indicates the number of government schemes to be undertaken and does not specify the panchayats that will benefit from them. The panchayats receiving a water supply scheme will be selected on the recommendation of the district panchayats involved.

The nationwide shortage of technical manpower in general and manpower for construction and maintenance of water supplies in particular has been a handicap in designing and implementing water supply programs. This situation is likely to prevail during the next few years. Therefore, RCUP has attempted to keep manpower requirements to a minimum.

His Majesty's Government plans a "balanced national development" in all 4 development regions. But in the water supply sector, the balanced development strategy goes further down to the district level since drinking water is a high priority to every district. The number of schemes proposed under RCUP is suited to the government's plan. The RCU Project has been

designed to fit within the national strategy of balanced development.

The RCU Project cover portions of 3 districts, with another district, Mustang, fully covered. In all these districts the number of proposed schemes is proportional to the number of panchayats within the project boundary and the total number of panchayats in the concerned district.

Altogether 82 RCUP schemes were planned for construction by the RCUP survey team: 47 in Daraundi, 15 in Kulekhani and 20 in Kaligandaki. Besides the schemes identified and assessed for feasibility during the RCUP field study, a few schemes identified in the Integrated Rural Development Project studies and a few surveyed by the Water Supply and Sewerage Department are also incorporated under the RCUP program. In all, the total number of individual system is 99. For the convenience of construction very small water systems within one panchayat are grouped together; hence, the number of schemes (82) is fewer than number of systems (99).

Detailed investigation, survey and design will be undertaken in the first year, with construction work beginning in subsequent years. The following table shows the number of large and small scale schemes proposed for construction separately for the two 5 year periods in each of the catchment areas. Details of the year-wise programs may be found in a separate Attachment (See. 4.1.7, 4.2.8 & 4.3.9). The tables in this attachment clearly establishes the first 5 year program in detail with a yearly breakdown, but the later 5 year program is not broken down by year. The following table summarizes the program for the first and second five year periods:

Table 4

TOTAL NO. OF SCHEMES PROPOSED UNDER RCUP

First 5 years

	Catchment Area	District	No. of Schemes Large	Small	Total
1.	Kulekhani	Makawanpur	2	11	13
2.	Daraundi	Gorkha	7	12	19
3.	Kaligandaki	Mustang	1	8	9
		Myagdi	-	8	8
		Total	10	39	49

Second 5 Years

	Catchment Area	District	No. of Schemes Large	Small	Total
1.	Kulekhani	Makawanpur	-	2	2
2.	Daraundi	Gorkha	2	26	28
3.	Kaligandaki	Mustang	-	-	-
		Myagdi	-	3	3
		Total for 10 years	12	70	82

7. Priorities

It is the policy of His Majesty's Government to entrust the village and district panchayats with the responsibility for project formulation and priority setting. But usually the project formulated and priorities established by the communities are not based on objective criteria, unless the communities already have an existing project available for their appraisal.

The schemes included here are, therefore, programmed for implementation in order of their relative merits as determined by objective criteria. The merits of a scheme are determined according to the following factors: (1) Hardship (the greater the existing "hardship" the more likely the scheme), (2) Cost (per capita and per litre), (3) potential population coverage, and (4) adequacy of the proposed source.

In evaluating the merits of different schemes, the latter 3 factors were easy to assess but the "hardship" factor was often difficult to evaluate. Physical verification of distance and climb involved, discharge and sanitary situation of water sources in each community were considered too time consuming to determine with precision. Therefore, a hardship judgement was based on the impressions of the individual field team members, and the determinations are thus qualitative rather than quantitative.

Particularly in recent years, His Majesty's Government requires "people's participation" in most phases of rural development. Generally rural people are more willing to participate in water supply construction than in other development projects, as was observed by the field team. Although all possible efforts were made to be objective in according priority for various schemes, community participation in this process could not be effectively carried out, for reasons mentioned earlier. An appropriate step in this context would be to encourage the community representatives to agree to the present project priorities. Any alternate approach should be strictly examined against the merit criteria noted above.

8. Investment Needs

The table below gives an estimate of the investment needed in each catchment basin to accomplish the water supply program as envisaged by RCUP. The cost is subdivided into the 4 following categories:

(1) Project construction cost: This includes the sum of the direct construction and supervision cost. A preliminary estimate of each scheme has been made to determine the construction costs. An additional 15% of the construction cost is allocated for supervision cost. (See separate appendix.)

(2) Engineering cost: Provision of consulting fees had been made for payment to local consultants who will be hired for survey and design work. This will be needed in the first year of the RCUP.

(3) Training cost: Provision for local training in Nepal of low level technicians has been made. Roughly, the cost allocation to each catchment area would be in proportion to the number of schemes implemented. An overseas training cost is included in the overall RCUP training program, and is not part of the investment needs listed here.

(4) Tools and equipment: A lump sum for tools, equipment and transport vehicles has been made, but this cannot be calculated for individua schemes or for the separate catchment areas. Expenditure under this item would be incurred in the first year of the project.

Table 5

INVESTMENT NEEDED IN WATER SUPPLY PROGRAM

First 5 Years

Catchment	Project Const. Cost in Rs. 1/	Engineering Cost in Rs. 2/	Training Cost in Rs. 3/	Total Cost in Rs.
Kulekhani	13,41,500	1,90,000	14,000	15,45,500
Daraundi	51,80,200	5,50,000	46,000	57,76,200
Kaligandaki	20,86,800	3,00,000	20,000	24,06,800
	86,08,500	10,40,000	80,000	97,28,500
Tools/Equipment 4/	-	-	-	10,00,000
			Sub-Total: -	1,07,28,500

Second 5 Years

Kulekhani	1,13,700	-	-	1,13,700
Daraundi	35,39,300	-	20,000	35,59,300
Kaligandaki	2,09,100	-	-	2,09,100
Sub-Total:	38,62,100	-	20,000	38,82,100
Total Rs.	1,24,70,600	10,40,000	1,00,000	1,46,10,600

1/ See Attachment 5.0.10, 5.1.11, 5.2.12 & 5.3.13 for year-wise allocation to each of the two implementing agencies i.e. Department of Water Supply and Sewerage (DWSS) and Local Decelopment Department (LDD) for each catchment.

2/ Engineering cost allocation for DWSS and LDD will be approximately Rs. 1,90,000 and 8,50,000 respectively.

3/ Training cost is allocated to DWSS.

4/ Tools and equipment cost will be equally divided between DWSS and LDD.

The following table shows the total cost required each year for implementing the proposed program. Foreign exchange required each year is shown separately and is included in total cost. It is estimated that the foreign exchange will be 40 percent of the total cost.

Year-wise Allocation[1/]

1st	6,90,000	13,50,000	20,40,000	8,16,000
2nd	9,58,000	10,37,900	19,95,900	7,98,400
3rd	13,41,500	13,42,000	26,83,500	10,73,400
4th	10,52,900	9,05,600	19,58,500	7,83,400
5th	10,28,700	10,21,900	20,50,600	8,20,200
Sub-Total of first 5 year	50,71,100	56,57,400	1,07,28,500	42,91,400
6th year	9,65,200	6,66,400	16,31,600	6,52,600
7th to 10th year	3,50,100	19,00,400	22,50,500	9,00,200
Sub-Total 2nd year	13,15,300	25,66,800	38,82,100	15,52,800
Total	63,86,400	82,24,200	1,46,10,600	58,44,200

1/ In the above table the 1st year cost includes engineering and tools/equipment, and the latter 5 year project construction cost includes in-country training under DWSS allocation.

9. Implementing Agencies

Rural water supply construction in Nepal is initiated through either the Government or the Panchayat sectors. Schemes implemented in the Panchayat sector are usually limited to small scale projects. Here financing of construction is partially met by the government grants to the district panchayats. But very often the lump sum provided falls short of even meeting the pipe costs. The deficit is supposed to be met by local contributions in terms of cash and labour. Another problem is that the local district engineer and the limited technical staff are responsible for many other district-level development activities and, thus, often find little time to design and supervise the construction of widespread community water supply schemes. Thus under the panchayat sector, the limited funds and inadequate technical support in system installation has mostly resulted in unreliable water supplies, a low service level, and frequent or total breakdown of the system.

As a result, the major part of water supply implementation is done by the government sector. The Department of Water Supply and Sewerage under the Ministry of Water, Power and Irrigation, and the Local Development Department, under the Ministry of Home and Panchayat are the two government agencies responsible for rural water supply construction. But the extent of responsibility and the methods of operation differ between the two.

The Department of Water Supply and Sewerage undertakes schemes covering an area with a population of 1500 or more and the entire construction cost is financed by the government or arranged through bilateral aid. In general, the construction period extends over one year and is entirely supervised by departmental staff. By contrast, the Local Development Department undertakes schemes covering a population of less than 1500 and incorporates compulsory local contributions in terms of labour. The cost of pipes, cement, OGI sheets, steel, timber, skilled labour and long-distance transport is financed jointly by the government and UNICEF. Supervision of construction is supplemented by volunteers from Germany, the Netherlands, Switzerland and the U.S. Peace Corps in addition to the departmental staff. Usually the construction period is less than a year. Both these agencies suffer a shortage of technical manpower and have to hire consultants for survey and design work. Both the departments operate through 3 regional offices in 3 development regions, excluding the Central Region which is covered by the Central Office.

The proposed RCUP organization suggests project implementation through

the concerned line agencies of the government (see Appendix N). Accordingly, it is proposed that water supply construction be undertaken by both agencies, namely, WSSD and LDD. The number of schemes to be implemented by WSSD and LDD is 12 and 70 respectively in the project area.

An organization chart is presented below showing the interrelation of the implementing agencies and their organs at various levels, based on the suggestions made under RCUP organization. This organizational framework does not envisage any change in the structure of the implementing agencies. The schemes to be constructed by WSSD are termed "large" and those for LDD are called "small."

10. Operation and Maintenance

Most of the community water supplies in Nepal are maintained by local panchayats, although some major systems are still maintained by WSSD. Casual grants are extended by WSSD to many communities for major system repairs, extension and augmentations. It has been the policy of HMG to make the community responsible for operating and maintaining their own system as soon as the system is commissioned. Experience shows that about 3% of the construction cost is incurred each year for operation and maintenance of a rural system.

11. Minimum Professional and Sub-Professional Manpower Needs

The following table shows the total professional and sub-professional person power needed for the proposed water supply construction in each year. The figures do not include the person power needs for survey and design. But a more detailed table is attached to this report (6.0.14), showing these requirements in each of the catchment areas. Estimates are based on the experience of the two main agencies, WSSD and LDD. It may be noted that the person power needs for each scheme to be constructed by WSSD and LDD differ. The scale of the schemes and the operating methods of the two agencies are different in that WSSD uses a greater number of person years in each scheme than does LDD.

Table 6

MINIMUM PROFESSIONAL AND SUB-PROFESSIONAL MANPOWER NEEDS

	W.S.S.D.		L.D.D.		Total	
	Engineer	Overseer	Engineer	Overseer	Engineer	Overseer
1st	-	-	-	-	-	-
2nd	1	4	4	9	5	13
3rd	3	7	4	10	7	17
4th	2	4	4	10	6	14
5th	2	4	4	10	6	14
Sub-Total	8	19	16	39	24	58
6th	2	4	3	9	5	13
7th to 10th	1	2	8	25	9	27
Sub-Total	3	6	11	34	14	40
Total M/Y	11	25	27	73	38	98

12. Local Labour Mobilization

The table below shows the total labour to be mobilized in each catchment area during the entire RCUP construction period. Unskilled labour will be available within each of the construction sites whereas skilled labourers such as masons, carpenters and blacksmiths would, in many cases, have to be hired from neighboring communities. Pipe-fitters would not be readily available and should be trained at the local level (see below). A separate Attachment (7.1.15, 7.2.16 & 7.3.17) shows the yearly labour mobilization in each catchment basin.

Table 7

LOCAL LABOUR MOBILIZED

Catchment	LABOR Skilled	LABOR Unskilled	Total
Kulekhani	1,520	22,280	23,800
Daraundi	12,520	104,690	117,210
Kaligandaki	2,400	26,440	28,840
Total	16,440	153,410	169,850

13. Training Needs

Training facilities may be classified into the 3 levels given below:

(1) High Level: In-service training opportunities will be created for the engineers engaged in RCUP. Short-term courses in resource conservation and utilization are proposed to make participants familiar with the problems and able to develop their roles effectively. The number of engineering personnel to be trained is not yet determined, but a tentative figure would be about 10 to 12 persons over a period of 5 to 6 years.

(2) Middle Level: The majority of the construction schemes need no professional supervision for long periods. WSSD and LDD are presently conducting condensed courses in rural water supply with a view to training technicians in this limited field only. Trainees are drawn from personnel with lower academic qualifications. Those who complete this limited course are expected to be adequately trained for implementing simple water supply schemes, under limited professional surveillance. This training falls under the regular activity of the water supply agencies and hence is excluded from the RCUP program.

(3) Low Level: Skilled plumbers are scarce in Nepal. Many completed water schemes work unsatisfactorily or soon cease to work in the face of the shortage of this skilled labour. Presently, training courses are conducted in this field in a couple of technical institutes, but most of the trainees are absorbed in urban areas. Training in plumbing is specifically made part of the RCUP program. It is estimated that in all about 100 plumbers are to be trained. Each year the trainees are to be drawn from the communities scheduled to have a piped water supply the following year.

14. Design Criteria

Preliminary designing of the components of each scheme are based on the design criteria set by WSSD. Later the same criteria has to be adopted incorporating occasional changes at the detail design stage. These design criteria are briefly outlined as follows:

(1) Design periods — 15 years

(2) Annual Population Growth Rate

a. Kulekhani	2.5%
b. Daraundi	2.0%
c. Kaligandaki	2.0%

(3) Water Demand

a. Domestic	45 l.p.c.d.
b. Non-domestic	
(1) Big animals	45l/animal/day
(2) Small animals	20l/animal/day
(3) Poultry	20l/100/birds/day
(4) Health Post Lump Sum	2500 l/day (Lump sum)
(5) School	10 l/pupil/day

(4) Continuous 24 Hour Supply

The system design is to be based on a continuous 24 hour supply as far as practicable.

(5) Variation in Rate of Consumption

The distribution pipe size is to be based on the cumulative flow of taps, assuming no variation in rate of consumption. The minimum flow of each tap should be 14 liters per minute.

(6) Service Reservoir

Storage capacities of following sizes will be provided based on time taken to supply the design demand.

Supply Time	Storage Capacity
18 to 24 hours	1/2 day storage
12 to 18 hours	1/3 day storage
9 to 12 hours	1/4 day storage

(to provide a minimum of 1/4 day storage whenever needed.)

(7) Location of Public Tap

The number of consumers per tap shall be in the region of 200 persons. No tap shall be farther than 150 m from the settlement, and the climb involved shall not be more than 50 m.

15. Conclusions

(1) Although water supply technology has been highly developed in recent times, the basic need of rural Nepal can best be met through simple schemes designed to alleviate the acute shortage of drinking water. A gradual change in technology and facilities has to be introduced in accordance with changing socio-economic conditions of the rural community.

(2) The proposed schemes reflect the perceived needs of the local population. Even further requests for more piped water is expected in time as more and more people realize the benefits of piped water. Furthermore, increased government expenditures on rural water supply will also stimulate the demand for more piped water facilities. Working out a long term plan and program is difficult and a periodic review and revision will be necessary.

(3) The government policy to make the community (District Panchayat) responsible for selection and priority rating of water schemes, however appreciable this may be, will not result in successful water projects unless technical and economic appraisals of the areas are made. Therefore, the appropriate action would be to carry out preliminary studies on a large number of schemes in a given area with local representatives participating in the technical and economic evaluation of the schemes. The implementation should be undertaken in accordance with the scheme's technical and economic merits.

(4) Many schemes are likely to be constructed locally prior to RCUP input. Nevertheless, requests for reinstallation of these schemes may come because of the unsatisfactory working of the system. To avoid duplication and waste of resources, the district panchayat is advised not to finance local requests for any schemes that are already listed in the RCU Program.

(5) One reason for poor performance of schemes installed locally is the lack of well defined criteria and service standard. Therefore, a uniform adherence to one standard should be ensured through the district engineers.

RCU Project

Attachment 1.1.1

KULEKHANI WATERSHED

EXISTING WATER SUPPLY SITUATION 1/

Sr#	Name of Panchayat	Population	Pipe Water Supply		Spring		Kuwas		Stream & Kulo		Remarks
			Population	%	Population	%	Population	%	Population	%	
1.	Markhu	2,475 2/	Nil	Nil	866	35.0	213	6.1	1,396	56.4	
2.	Todke	2,768 2/	Nil	Nil	1,407	50.8	Nil	Nil	1,361	49.2	
3.	Sisneri	2,371	Nil	Nil	998	42.1	839	35.4	534	22.5	
4.	Chitlang	8,300	142	1.8	1,730	20.8	2,144	25.9	4,279	51.5	
5.	Phakhel	1,670	185	11.1	355	21.2	716	42.9	414	24.8	
6.	Palung	4,800	1,531	31.9	561	11.7	110	2.3	2,598	54.1	
7.	Lamachaur	1,718 2/	Nil	Nil	1,304	75.9	Nil	Nil	414	248	
8.	Ipaukhubari	1,389	Nil	Nil	534	38.5	96	6.9	759	54.6	
9.	Kogte	1,200	Nil	Nil	253	21.1	86	7.2	861	71.7	
10.	Sikharkot	5,000	1,648	32.7	Nil	Nil	1,376	273	1,976	40.0	
11.	Tistung	6,100	Nil	Nil	Nil	Nil	Nil	Nil	6,100	100.0	
	Total	37,791	3,506	9.3	8,607	20.6	6,340	15.2	21,173	50.9	

Note: 1/ This table is based on Panchayat boundary prior to Falgun 035.

2/ Population is exclusive of the part rehabilated elsewhere by Kulekhani Project.

RCU PROJECT

DARAUNDI WATERSHED

EXISTING SITUATION

Sr.#	Name of Panchayat	Population	Pipe Water Supply		Spring		Kuwas		Stream & Khola		Remarks
			Population	%	Population	%	Population	%	Population	%	
1.	Shreenath Kot	3,004	Nil	Nil	982	32.7	1,229	40.9	793	26.4	
2.	Manakamana	3,433	-	-	2,231	65.0	1,098	32.0	104	63.0	
3.	Harmi	4,456	-	-	802	18.0	847	19.0	2,807	-	
4.	Jaubari	3,581	-	-	1,719	48.0	1,362	52.0	-	-	
5.	Ghairung	4,251	-	-	4,251	100.0	-	-	-	-	
6.	Palungtar	5,969	1,325	22.2	1,641	27.5	3,003	50.3	-	-	
7.	Ampipal	4,365	279	6.4	3,082	70.6	1,004	23.0	-	-	
8.	Chhoprak	5,804	-	-	900	15.5	3,134	54.0	1,770	30.5	
9.	Raniswara	4,348	-	-	3,870	89.0	-	-	478	11.0	
10.	Bhogtani	3,912	-	-	3,638	93.0	-	-	274	7.0	
11.	Taklung	4,914	-	-	2,309	47.0	2,113	43.0	492	10.0	
12.	Taple	3,757	-	-	1,830	48.7	1,927	51.3	-	-	
13.	Taku	6,167	-	-	2,319	37.6	3,571	57.9	277	4.5	
14.	Saurpani	5,770	-	-	1,979	34.3	3,300	57.2	491	8.5	
15.	Simjung	5,076	-	-	1,898	37.4	2,360	46.4	818	16.1	

(Continued)

DARAUNDI WATERSHED

Attachment 1.2.2

Sr.#	Name of Panchayat	Population	Pipe Water Supply		Spring		Kuwas		Stream & Khola		Remarks
			Population	%	Population	%	Population	%	Population	%	
16.	Deurali	3,197	-	-	365	11.4	1,087	34.0	1,745	54.6	
17.	Dhuwankot	2,512	-	-	585	23.3	1,751	69.7	176	7.0	
18.	Gaikhur	4,036	666	16.5	1,146	28.4	1,481	36.7	743	18.4	
19.	Mirkot	3,792	-	-	1,255	33.1	1,858	49.0	679	17.9	
20.	Khoplang	4,562	-	-	1,638	35.9	2,523	55.3	401	8.8	
21.	Barpak	4,440	2,353	53.0	1,212	27.3	875	19.7	-	-	
22.	Swanra	3,629	-	-	936	25.8	1,822	50.2	871	24.0	
23.	Khanchok	6,315	272	4.3	4,401	69.7	1,314	20.8	328	5.2	
24.	Pandrung	4,943	445	9.0	1,073	21.7	3,163	64.0	262	5.3	
	Total	1,06,233	5,340	50%	46,062	43.4%	41,322	38.8%	13,509	12.7%	

KALIGANDAKI WATERSHED

EXISTING WATER SUPPLY SITUATION

MYAGDI

Sr.#	Name of Panchayat	Total Population	Pipe Watersupply		Spring		Kuwas		Khola & Kulo		Remarks
			Population	%	Population	%	Population	%	Population	%	
1.	Piple	3,157	-	-	2,947	93.30	-	-	210	6.70	
2.	Darmiya	3,325	-	-	1,778	44.50	-	-	1,847	55.60	
3.	Jheen	2,827	-	-	1,100	38.90	627	22.20	1,100	38.90	
4.	Ghatang	2,842	-	-	2,842	100	-	-	-	-	
5.	Doba	2,010	893	44.40	-	-	-	-	-	-	
6.	baraha	2,591	-	-	345	13.30	863	33.30	1,383	53.40	
7.	Beg Khola	1,953	558	28.60	1,209	61.90	-	-	187	9.60	
8.	Rakhu Bhagbati	3,157	-	-	2,683	85.00	-	-	474	15.00	
9.	Dana	2,624	-	-	-	-	875	33.40	1,749	66.70	
10.	Sikha	4,733	1,200	2.40	1,766	37.30	-	-	1,766	37.30	
11.	Histan Mandale	2,572	1,700	66.00	290	11.30	-	-	582	22.60	
12.	Ramche	3,321	800	24.10	168	50.60	-	-	870	25.30	
	Sub-Total	35,112	5,151	14.7	16,341	46.50	2,365	6.7	11,255	32.0	

(Continued)

MUSTANG

Sr.#	Name of Panchayat	Total Population	Pipe Water Supply		Spring		Kuwas		Khola & Kulo		Remarks
			Population	%	Population	%	Population	%	Population	%	
1.	Chhusang	1,170	71	6.10	229	19.60	163	14.0	707	60.40	
2.	Kagbeni	1,032	559	54.20	272	26.40	-	-	201	19.50	
3.	Marpha	1,173	1,075	91.60	-	-	-	-	98	8.40	
4.	Tukche	648	520	80.30	-	-	-	-	128	19.80	
5.	Kobang	821	265	32.30	210	25.60	-	-	346	42.10	
6.	Lete	860	606	70.50	-	-	-	-	254	29.50	
7.	Kunjo	825	-	-	641	77.70	-	-	184	22.30	
8.	Surkhang	648	-	-	408	62.90	-	-	240	37.10	
9.	Chhonhup	900	112	12.50	-	-	-	-	788	85.50	
10.	Lomthang	856	-	-	-	-	-	-	856	100	
11.	Dhami	905	-	-	227	25.00	-	-	678	75	
12.	Charang	704	-	-	115	16.30	-	-	589	83.70	
13.	Chhoser	815	-	-	82	10.10	-	-	733	89.90	
14.	Jharkot	561	-	-	281	50.00	-	-	280	50	
15.	Muktinath	841	-	-	421	50.00	-	-	420	50	
16.	Jomsom	2,198	-	-	1,648	75.00	-	-	550	25	
	Sub-Total	14,957	3,208	17.80	4,534	30.5	163	1.1	7,052	47.1	
	Total	50,069	8,359	16.7	20,845	41.7	2,528	5.0	18,307	36.6	

RCU PROJECT

KULEKHANI WATERSHED

Total Water Supply Coverage of Present Population

Sr.#	Name of Panchayat	Total Population	Existing Piped Water Supply		Proposed Piped Water Supply		Project Under Construction		Total Piped Water Supply		Remarks
			Population	%	Population	%	Population	%	Population	%	
1.	Markhu	2,475	Nil	Nil	193	7.8	-	-	193	7.8	
2.	Todke	2,768	-	-	816	29.5	-	-	816	29.5	
3.	Sisneri	2,371	-	-	645	23.0	-	-	645	23.6	
4.	Chitlang	8,300	142	1.7	940	11.3	369	4.5	1,820	21.9	
5.	Phakhel	1,670	185	11.1	440	16.3	-	-	625	37.4	
6.	Palung	4,800	1,531	31.9	1,442	30.0	-	-	2,973	61.9	
7.	Lamachour	1,718	-	-	774	45.1	-	-	774	45.1	
8.	Ipaukhubari	1,389	-	-	65	4.7	-	-	65	4.7	
9.	Kogte	1,200	-	-	221	18.4	-	-	221	18.4	
10.	Sikarkot	5,000	1,648	32.7	1,366	27.3	-	-	3,004	60.0	
11.	Tistung	6,100	-	-	-	-	-	-	-	-	
	Total	37,791	3,506	9.3	7,271	19.2	369	1	11,146	29.6	

RCU PROJECT

DARAUNDI WATERSHED

Total Water Supply Coverage of Present Population

Sr.#	Name of Panchayat	Total Population	Existing Piped Water Supply		Proposed Piped Water Supply		Project Under Construction		Total Piped Water Supply	
			Population	%	Population	%	Population	%	Population	%
1.	Shreenath Kot	3,004	-	-	1,500	50.0	-	-	1,500	50.0
2.	Manakamana	3,433		-	2,275	64.4	-	-	2,275	64.4
3.	Khoplang	4,562	-	-	2,670	58.5	215	4.7	2,885	63.5
4.	Gaikhur	4,036	1,146	28.4	875	21.7	-	-	2,021	50.1
5.	Harmi	4,456	-	-	1,150	25.8	1,360	30.5	2,510	56.3
6.	Deorali	3,197	-	-	630	19.7	-	-	630	19.7
7.	Mirkot	3,792	-	-	400	10.5	-	-	400	10.5
8.	Jaubari	3,581	-	-	525	14.7	894	11.0	919	25.7
9.	Dhuwakot	2,512	-	-	255	10.2	-	-	255	10.2
10.	Ghairung	4,251	-	-	350	8.2	-	-	350	8.2
11.	Palungtar	5,969	1,325	22.2	1,600	26.8	-	-	2,925	49.0
12.	Anpipal	4,365	279	6.4	760	14.4	262	6.0	1,301	29.8
13.	Chhoprak	5,804	-	-	935	16.1	-	-	935	16.1
14.	Phinam	2,807	-	-	160	5.7	-	-	160	5.7
15.	Raniswara	4,348	-	-	825	19.0	-	-	825	19.0
16.	Bhotgeni	3,912	-	-	2,115	54.0	-	-	2,115	54.0
17.	Taklung	4,914	-	-	780	15.9	-	-	780	15.9
18.	Taple	3,757	-	-	900	23.9	-	-	900	23.9
19.	Taku	6,167	-	-	1,570	25.5	-	-	1,570	25.5

(Continued)

DARAUNDI WATERSHED

Sr.#	Name of Panchayat	Total Population	Existing Piped Water Supply		Proposed Piped Water Supply		Project Under Construction		Total Piped Water Supply		Remarks
			Population	%	Population	%	Population	%	Population	%	
20.	Saurpani	5,770	-	-	200	3.6	2,908	50.4	3,117	54.0	
21.	Simjung	5,076	-	-	1,815	35.7	-	-	1,815	35.7	
22.	Barpak	4,440	2,353	53.0	250	5.6	-	-	2,603	58.6	
23.	Panchok	6,315	272	4.3	1,330	21.1	-	-	1,602	25.4	
24.	Swara	3,629	-	-	2,360	65.0	-	-	2,360	65.0	
25.	Pandrung	4,943	449	9.0	240	4.9	-	-	689	13.9	
26.	Gorakhali	6,504	-	-	-	-	1,890	29.0	1,890	29.0	
27.	Bungkot	6,068	-	-	-	-	5,638	93.0	5,638	92.0	
28.	Taranagar	3,259	-	-	-	-	1,304	40.0	1,304	40.0	
29.	Mucchok	3,409	-	-	2,300	-	-	-	2,300	67.8	
30.	Nareshwar	3,729	-	-	1,500	40.2	-	-	1,500	40.2	
	Total	132,009	5,824	4.4	30,270	22.9	13,971	10.6	50,074	37.9	

KALIGANDAKI WATERSHED

Total Water Supply Coverage of Present Population

MYAGDI

Sr.#	Name of Panchayat	Total Population	Existing Piped Water Supply		Proposed Piped Water Supply		Project Under Construction		Total Piped Water Supply		Remarks
			Population	%	Population	%	Population	%	Population	%	
1.	Piple	3,157	-	-	315	9.97	-	-	315	9.97	
2.	Darmiya	3,325	-	-	-	-	-	-	-	-	
3.	Jheen	2,824	-	-	616	21.80	-	-	616	21.8	
4.	Ghatang	2,842	-	-	641	22.50	-	-	641	22.5	
5.	Doba	2,010	893	44.40	436	21.70	-	-	1,329	66.10	
6.	Baraha	2,591	-	-	666	25.70	-	-	666	25.7	
7.	Beg Khola	1,953	558	28.60	-	-	-	-	558	28.60	
8.	Rakhu Bhagbati	3,157	-	-	567	17.90	-	-	567	17.90	
9.	Dana	2,624	-	-	-	-	-	-	-	-	
10.	Sikha	4,733	1,200	25.40	-	-	-	-	1,200	25.40	
11.	Histan Mandale	2,572	1,700	66.00	-	-	-	-	1,700	66.00	
12.	Ramche	3,321	800	24.10	-	-	-	-	800	24.10	
13.	Pakhapani	2,331	-	-	-	-	-	-	-	-	
14.	Kiune Mangale	1,902	-	-	-	-	-	-	-	-	
	Sub-Total	39,342	5,151	13.1	3,241	8.2	-	-	8,392	21.3	

(Continued)

Attachment: 2.3.6

KALIGANDAKI WATERSHED

Total Water Supply Coverage of Present Population

MUSTANG

Sr.#	Name of Panchayat	Total Population	Existing Piped Water Supply		Proposed Piped Water Supply		Project Under Construction		Total Piped Water Supply		Remarks
			Population	%	Population	%	Population	%	Population	%	
1.	Chhusang	1,170	71	6.10	586	50.70	252	21.50	902	77.70	
2.	Kagbeni	1,032	559	54.20	237	22.90	-	-	746	77.10	
3.	Marpha		539	45.60	540	50.2	-	-	1,075	91.60	
4.	Tukche	648	520	80.30	-	-	-	-	520	80.30	
5.	Kobang	821	265	32.30	132	16.10	165	20.10	562	68.50	
6.	Lete	860	606	70.50	-	-	254	29.50	860	100	
7.	Chhonhup	900	112	12.40	151	16.80	-	-	263	29.20	
8.	Lomthang	856	-	-	755	88.20	-	-	755	88.20	
9.	Surkhang	648	-	-	100	15.40	-	-	100	15.40	
10.	Kunjo	825	-	-	297	35.90	-	-	297	36.00	
11.	Jharkot	561	-	-	-	-	-	-	-	-	
12.	Muktinath	841	-	-	-	-	-	-	-	-	
13.	Jumsom	2,198	-	-	1,277	58.10	-	-	1,277	58.10	
14.	Dhami	905	-	-	-	-	-	-	-	-	
15.	Charang	705	-	-	-	-	-	-	-	-	
16.	Chhosan	815	-	-	-	-	-	-	-	-	
	Sub-Total	14,957	3,200	21.4	2,328	15.6	671	4.5	6,207	41.5	
	Total	54,299	7,819	14.4	7,316	13.5	671	1.20	15,806	29.10	

Attachment: 3.1.7

RCU PROJECT

KULEKHANI WATERSHED

Implementation Programme

Projects Proposed to be Implemented by

Department of Water Supply & Sewarage

First 5 Years

Panchayat	Number of System	Ward Covered	Population (Present/Design)	Total Estimate Cost
		2nd Year		
Chitalang	2	2,3,4,4,&5	1309/1898	Rs. 1,75,100
		3rd Year		
Sikharkot	1	7&8	1366/1980	Rs. 1,15,300
			Grand Total:	Rs. 2,90,400

Projects Proposed to be Implemented by

Local Development Department

First 5 Years

		2nd Year		
Palung	2	8&9	527/796	Rs. 1,98,600
Markhu	1	6	193/280	Rs. 1,00,000
			Sub-Total	Rs. 2,98,600
		3rd Year		
Palung	1	2,3,&4	908/1322	Rs. 1,19,700
Lamachour	1	2,4,&9	774/1122	Rs. 1,79,400
Sisneri	2	2&6	182/264	Rs. 43,200
			Sub-Total	Rs. 3,42,300

Contd...

Attachment: 3.1.7

Panchayat	Number of System	Ward Covered	Population (Present/Design)	Total Estimate Cost
		4th Year		
Phakhel	2	1,2,&2(part)	440/639	Rs. 1,21,400
Kogte	1	3&8	121/183	Rs. 38,800
Sisneri	2	7&9	303/439	Rs. 1,29,200
			Sub-Total	Rs. 2,89,400
		5th Year		
Todke	1	2	400/580	Rs. 22,400
Sisneri	1	3	160/232	Rs. 57,900
Kogte	1	2	100/145	Rs. 39,500
			Sub-Total	Rs.1,19,800
			Sub-Total (5 years)	Rs.10,51,000
		6th Year		
Todke	1	3&4	416/624	Rs. 58,500
Ipaukhubari	1	7	65/97	Rs. 55,200
			Sub-Total	Rs.1,13,700
			Grand Total	Rs.11,64,700

Attachment: 3.2.8

RCU PROJECT

DARAUNDI WATERSHED

IMPLEMENTATION PROGRAMME

Projects Proposed to be Implemented by

Department of Water Supply & Sewarage

First 5 Years

Panchayat	Number of System	Ward Covered	Population (Present/Design)	Total Estimate Cost
		2nd Year		
Muchok	2	1,2,3,4,4,6,&9	2300/3105	Rs. 8,29,300
			Sub-Total	Rs. 8,29,300
		3rd Year		
Khoplang	3	1,4,5,6,8,9	2670/3605	Rs. 5,95,200
Shreenathkot	1	1,2,3,4,5,6	1500/2025	Rs. 5,67,400
			Sub-Total	Rs.11,62,600
		4th Year		
Saurpani	3	1,2,3,4,6,9	2360/^187	Rs. 7,85,900
Manakamana	4	3,5,6,7,8,9	2275/3072	Rs. 4,68,600
			Sub-Total	Rs.12,54,500
		5th Year		
Swara	6	1,2,3,4,6,9	2360/3187	Rs. 7,85,900
Simjung	3	1,2,3,4,5,6	1165/1573	Rs. 2,64,200
			Sub-Total	Rs.10,50,100
			Total	Rs.42,96,500
		Second 5 Years		
		6th Year		
Harmi	2	1,2,3,4,5,6	1150/1555	Rs. 3,04,700
Ampipal	1	8&9	760/1026	Rs. 5,70,600
			Sub-Total	Rs. 8,75,300
			Grand Total	Rs.51,71,800

Remarks: Harmi & Anpipal is proposed to be supplied by a single intake and transmission system, hence may be treated as single scheme.

Attachment: 3.2.8

Projects Proposed to be Implemented by Local Development Department

First 5 Years

Panchayat	Number of System	Ward Covered	Population (Present/Design)	Total Estimate Cost
		2nd Year		
Nareshwor		6,8,9,&7	1000/1350	Rs. 2,01,300
			160/216	Rs. 31,200
			555/749	Rs. 1,32,200
			Sub-Total	Rs. 3,64,700
		3rd Year		
Taku		2	300/405	Rs. 43,000
Chhoprak		6	935/1262	Rs. 3,53,300
			380/378	Rs. 65,500
			Sub-Total	Rs. 4,61,800
		4th Year		
Taklung		1	500/675	Rs. 1,29,800
Jaubari		2,3	345/466	Rs. 78,600
Bhogteni		6	400/540	Rs. 1,02,600
			Sub-Total	Rs. 3,11,000
		5th Year		
Dhuwakot		3,4,5	255/345	Rs. 70,800
Palungtar		9	920/1242	Rs. 2,87,400
Mirkot		4,5	840/1134	Rs. 1,16,000
			Sub-Total	Rs. 4,74,200
			Total	Rs. 16,11,700
		Second 5 Years		
		6th Year		
Kanchok		5,6	240/311	Rs. 71,700
Palungtar		7,8	515/695	Rs. 2,21,800
Mirkot		-	495/668	Rs. 50,100
			Sub-Total	Rs. 3,43,600
23 Projects			1985/1989	Rs. 19,00,400
			Total	Rs. 2,24,400
			Grand Total	Rs. 38,55,700

Attachment: 3.3.9

KALIGANDAKI WATERSHED

Projects Proposed to be Implemented by

Local Development Department

First 5 Years

Panchayat	Number of System	Ward Covered	Population (Present/Design)	Total Estimate Cost
		2nd Year		
Mustang				
Chhesang	1	5 & 6	369/515	Rs. 1,28,000
Lomanthang	1	2 to 8	755/1017	Rs. 95,400
Myagdi				
Jheen	1	6 to 9	466/600	Rs. 74,000
Doba	1	9	436/586	Rs. 77,200
			Sub-Total	Rs. 3,74,600
		3rd Year		
Mustang				
Marpha	1	5 to 8	435/566	Rs. 1,89,200
Kowang	1	6	132/172	Rs. 32,700
Myagdi				
Piple	1	4	315/425	Rs. 66,100
Ghatang	1	1 & 2	641/863	Rs. 2,49,900
			Sub-Total	Rs. 5,37,900
		4th Year		
Mustang				
Marpha	1	8	105/137	Rs. 51,800
Chhonhup	1	3 & 4	151/203	Rs. 32,100
Myagdi				
Rakhu Bhagbati	1	1, 8 & 9	294/396	Rs. 1,11,000
Rakhu Bhagbati	2	2	273/395	Rs. 1,09,300
			Sub-Total	Rs. 3,04,200

Contd. of Attachment: 3.3.9

Panchayat	Number of System	Ward Covered	Population (Present/Design)	Total Estimate Cost
		5th Year		
Mustang				
Chhusang	1	8	90/117	Rs. 73,500
Kunjo	1	4 to 6	297/400	Rs. 88,200
Myagdi				
Jheen	1	6	170/230	Rs. 76,200
Baraha	1	1 to 4	666/897	Rs. 1,90,000
			Sub-Total	Rs. 4,27,900
			Total	Rs.16,44,600
		Second 5 Years		
		6th Year		
Myagdi				
Chhusang	1	7	100/135	Rs. 78,600
Kagbeni	1	2 & 3	237/308	Rs. 82,600
Surkhang	1	1 & 2	100/135	Rs. 47,900
			Sub-Total	Rs. 2,09,100
			Total	Rs.18,53,700
			Grand-Total	Rs.22,95,900

Contd. of Attachment: 3.3.9

RCU PROJECT

KALIGANDAKI WATERSHED

Implementation Programme

Project Proposed to be Implemented by

Department of Water Supply & Sewerage

First 5 Years

Panchayat	Number of System	Ward Covered	Population (Present/Design)	Total Estimate Cost
		2nd Year		
Mustang				
Jomsom	1	1 to 9	1277/1445	Rs. 4,42,200

Attachment 4.0.10

RCU PROJECT

WATER SUPPLY COMPONENT

Financial Outlay for Water Supply

Construction Cost

SUMMARY

Year	Allocation Rs. W.S.S.D.	Allocation Rs. L.D.D.	Total Rs.
1st Year	-	-	-
2nd Year	9,38,000	10,37,900	19,75,900
3rd Year	13,21,500	13,42,000	26,63,500
4th Year	10,32,900	9,05,600	19,38,500
5th Year	10,08,700	10,21,900	20,30,600
Sub-Total (First 5 Years)	43,01,100	43,07,400	86,08,500
6th Year	9,45,200	6,66,400	16,11,600
7th Year	3,50,100	19,00,400	22,50,500
Sub-Total (Second 5 years)	12,95,300	25,66,800	38,62,100
Total	55,96,400	68,74,200	1,24,70,600

Attachment: 5.1.11

RCU PROJECT

KULEKHANI WATER SUPPLY COMPONENT

Financial Allocation

Construction Cost

First 5 Years

Year	Allocation Rs. W.S.S.D.	Allocation Rs. L.D.D.	Total Rs.
1979/1980	-	-	-
1980/1981	1,75,100	2,98,600	4,73,700
1981/1982	1,15,300	3,42,300	4,57,600
1982/1983	-	2,90,400	2,90,400
1983/1984	-	1,19,800	1,19,800
Sub-Total	2,90,400	10,51,100	13,41,500

Second 5 Years

6th Year	-	1,13,700	1,13,700
Total	2,90,400	11,64,800	14,55,200

Attachment: 5.2.12

RCU PROJECT

DARAUNDI WATER SUPPLY COMPONENT

Financial Allocation

(Construction Cost)

Year	Allocation Rs. W.S.S.D.	Allocation Rs. I.D.D.	Total Rs.
First 5 Years			
1st Year	-	-	-
2nd Year	4,97,600	3,64,700	8,62,300
3rd Year	10,29,300	4,61,800	14,91,100
4th Year	10,32,900	3,11,000	13,43,900
5th Year	10,08,700	4,74,200	14,82,900
Sub-Total (5 years)	35,68,500	16,11,700	51,80,200
Second 5 Years			
6th Year	9,45,200	3,43,600	12,88,800
7th Year	3,50,100	19,00,400	22,50,500
8th Year	-	-	-
Sub-Total (5 years)	12,95,300	22,44,000	35,39,300
Total (10 years)	48,63,800	38,55,700	87,19,500

Attachment: 5.3.13

RCU PROJECT

KALIGANDAKI WATER SUPPLY COMPONENT

Financial Allocation

(Construction Cost)

First 5 Years

Year	Allocation Rs. W.S.S.D.	L.D.D.	Total Rs.
1st Year	-	3,00,000	3,00,000
2nd Year	2,65,300	3,74,600	6,39,900
3rd Year	1,76,900	5,37,900	7,14,800
4th Year	-	3,04,200	3,04,200
5th Year	-	4,27,900	4,27,900
Sub-Total (5 year)	4,42,200	19,44,600	23,86,800

Second 5 Years

6th Year	-	2,09,100	2,09,100
Total (10 year)	4,42,200	21,53,700	25,95,900

Attachment 6.0.14

Minimum Professional & Sub-Professional Manpower Needs for Water Supply Construction First 5 Year

Year	W.S.S.D. Engineer	W.S.S.D. Overseer	L.D.D. Engineer	L.D.D. Overseer	Total Engineer	Total Overseer
			KULEKHANI CATCHMENT			
1st Year	-	-	-	-	-	-
2nd Year	1	2	1	2	2	4
3rd Year	1	2	1	3	2	5
4th Year	-	-	1	3	1	3
5th Year	-	-	1	3	1	3
Sub-Total Man Years	2	4	4	11	6	15
			DARAUNDI CATCHMENT			
1st Year	0	0	0	0	0	0
2nd Year	-	1	1	3	1	4
3rd Year	1	3	1	3	2	6
4th Year	2	4	1	3	3	7
5th Year	2	4	1	3	3	7
Sub-Total Man Years	5	12	4	12	9	24

(Continued)

Contd. of Attachment: 6.0

Year	W.S.S.D.		L.D.D.		Total	
	Engineer	Overseer	Engineer	Overseer	Engineer	Overseer
			KALIGANDAKI CATCHMENT			
1st Year	-	-	-	-	-	-
2nd Year	-	1	2	4	2	5
3rd Year	1	2	2	4	3	6
4th Year	-	-	2	4	2	4
5th Year	-	-	2	4	2	4
Sub-Total Man Year	1	3	8	16	9	19
Total M/Y (5 Years)	8	19	16	39	24	58
6th Year	-	-	1	3	1	3
7th to 10th	-	-	-	-	-	-
Sub-Total M/Y	-	-	1	3	1	3
			DARAUNDI CATCHMENT			
6th Year	2	4	1	3	3	7
7th to 10th	1	2	8	25	9	27
Sub-Total M/Y	3	6	9	28	12	34
			KALIGANDAKI CATCHMENT			
6th Year	-	-	1	3	1	3
7th to 10th	-	-	-	-	-	-
Total M/Y (5 Years)	3	6	11	34	14	40
Total M/Y (10 Years_	11	25	27	73	38	98

Attachment: 7.1.15

RCU PROJECT

KULEKHANI CATCHMENT

CONSTRUCTION LABOUR REQUIREMENT

(MAN DAYS)

First 5 Years

Implementation Year	Labour Skilled	Labour Unskilled	Total
1st Year	-	-	-
2nd Year	350	7,510	7,860
3rd Year	630	6,200	6,830
4th Year	230	4,900	5,130
5th Year	220	1,950	2,170
Total	1,430	20,560	21,990
Second 5 Years			
6th Year	90	1,720	1,810
1st to 10th	1,520	22,280	23,800

Attachment: 7.2.16

RCU PROJECT

DARAUNDI CATCHMENT

CONSTRUCTION LABOUR REQUIREMENT

(MAN DAY)

First 5 Years

Implementation Year	Labour Skilled	Labour Unskilled	Total
1st Year	-	-	-
2nd Year	1,430	10,760	12,190
3rd Year	2,140	17,560	19,700
4th Year	2,430	16,420	18,850
5th Year	2,160	16,850	19,010
Total (t Years)	8,160	61,590	69,750

Second 5 Years

6th to 10th	4,360	43,100	47,460
1st to 10th	12,520	1,04,690	1,17,210

Attachment: 7.3.17

RCU PROJECT

KALIGANDAKI CATCHMENT

CONSTRUCTION LABOUR REQUIREMENT

(MAN DAYS)

First 5 Years

Implementation Year	Labour Skilled	Labour Unskilled	Total
1st Year	-	-	-
2nd Year	900	8,470	9,370
3rd Year	530	7,680	8,210
4th Year	530	3,820	4,350
5th Year	320	4,150	4,470
Total	2,280	24,120	26,400

Second 5 Years

6th Year	120	2,320	2,440
1st to 10th	2,400	26,440	28,840

ECU PROJECT

KULEKHANI CATCHMENT

Summary On Proposed Water Supply Schemes

Attachment: 8.1.18

Sr.#	Panchayat	Ward Nos. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
1.	Markhu	6	193	280	6	31000	Phagal Mool	Spring	86000	100000	357	3/23	110	
2.	Todke(1)	2	400	580	3	37000	Shimun Mool	"	86000	22400	39	-/61	63	
3.	(2)	3,4	416	624	4	60000	Khania Kholsa	"	561000	58500	94	-/93	96	
4.	Sisneri(1)	7	116	168	4	19000	Juge Kholsa	"	82000	637000	379	3/35	113	
5.	(2)	6	83	120	2	14000	Balchhi Kholsa	"	38000	21200	177	1/51	117	
6.	(3)	2	99	144	2	16000	Ritta Kholsa	"	129000	22000	153	1/38	111	
7.	(4)	9	187	271	3	3000	Chhapang Kholsa	"	453000	65500	242	2/18	110	
8.	(5)	3	160	232	4	26000	Pipi Kholsa	"	56000	57900	250	2/23	112	
9.	Chitlang(1)	2,3,4	1144	1659	6	123000	Mulpani Mool	"	302000	135600	82	1/10	75	
10.	(2)	5	165	239	6	25000	Dandaghar	"	129000	39500	165	1/58	104	
11.	Thakhel (1)	1,2	357	518	5	59000	Sisundol Mool	"	259000	79500	153	1/35	114	
12.	(2)	2(Part)	83	121	3	13000	Gothkholsa	"	104000	42900	355	3/30	107	
13.	Palung (1)	2,3,4	908	1322	7	128000	Dobhan Khola	"	259000	119700	91	-/94	97	

(Continued)

Summary On Proposed Water Supply Scheme--Kulekhani

Sr.#	Panchayat	Ward Nos. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
14.	Palung (2)	9	202	325	3	23000	Thulo Khoria upper mool	Spring (3)	43000	78400	241	3/41	71	
15.	(3)	8,9	325	471	6	36000	Thulo Khoria lower mool	Spring	86000	120200	255	3/34	76	
16.	Lama Chour	2,4,9	774	1122	7	90000	Devithan Kholsa	"	155000	179400	160	1/99	80	
17.	Ipaukhybari	7	65	97	1	10000	Salle Kholsa	"	138000	55200	569	5/52	103	
18.	Kegte (1)	3,3	121	183	3	19000	Chapadhol	"	112000	38800	212	2/04	104	
19.	(2)	2	100	145	2	22000	Dhamarkhola	"	10000	39500	272	3/95	69	
20.	Sikharkot	7,8	1366	1980	5	135000	Ogyal Khola	"	194000	115300	58	85	68	Surveyed by WSSD.
	Total		7271	10477	81	196.0×10^3			328×10^3	1.55200	139	1/59	87	

Attachment: 8.2.19

RCU PROJECT DARAUNDI WATERSHED

GORKHA

SUMMARY ON PROPOSED WATER SUPPLY PROJECTS

Sr.#	Panchayat	Ward Nos. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
1.	Shreenathkot	1,2,3, 4,5,6	1500	2025	22	242000	Sarangi Khola	Stream	216000	567400	280	2.62	106	
2.	Menkamana	5	125	169	1	20000	Kuwapani	Spring	6000	34900	206	5.81	35	
3.	"	3	350	473	2	50000	Padke Ko Mo[illegible]	"	43000	44700	102	1.04	97	
4.	Khoplang	4	555	750	5	63000	Phirpani Kholsa	Stream	26000	208700	278	8.02	34	
5.	"	2	515	695	9	64000	Dhanda Khola	Spring	62000	143600	205	2.31	88	
6.	Gaichaur	1	590	797	8	62000	Purpun Dara	"	21000	164000	205	7.80	26	
7.	"	9	275	371	4	33000	Nadibhir	"	8000	88200	238	11.02	21	
8.	Harmi	2	140	190	2	17000	Gamgemire	"	8000	31800	167	3.97	42	
9.	"	1,2,3,4,5,6	1010	1365	7	100000	Pankhola	Stream	327000	272900	200	2.73	73	
10.	Deorali	1	60	80	2	9000	Salangirid-hara	Spring	8000	57000	712	7.12	100	
11.	"	9	285	385	1	55000	Gunadikhola	"	21000	16000	42	0.76	54	
12.	"	8	160	216	2	24000	Sundari Kuwa	"	43000	31200	144	1.30	111	
13.	"	2	125	169	1	15000	Gurung Khol-sa	Stream	129000	38000	225	2.53	88	
14.	Mirkot	4,5	840	1134	5	130000	Thulo Dhara	Spring	43000	116000	102	2.70	38	

(Continued)

Summary On Proposed Water Supply Projects—Gorkha

Sr.#	Panchayat	Ward Nos. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
15.	Markot	8	495	668	6	71000	Chhapani	Spring	34000	50100	75	1.47	50	
16.	"	8	125	169	3	13000	Simla Kholma	"	3000	31000	183	10.33	18	
17.	Jaubari	2,3	345	466	6	67000	Thulo Kholma	Stream	86000	78600	169	1.17	143	
18.	"	4	180	243	4	35000	Chilaunekho-la	Spring	38000	101100	416	2.88	144	
19.	Dhuwakot	3,4,5	255	345	3	44000	Dharapani	Stream	51000	70800	205	1.60	127	
20.	Palungtar	9	920	1242	13	121000	Ranikhetsak-hra	"	142000	287400	231	2.37	97	
21.	"	7,8	515	695	11	61000	Dhad Khola	"	86000	221800	319	3.63	87	
22.	"	7	165	223	4	21000	Ahale Khola	"	25000	76600	343	3.64	94	
23.	Ampipal	8,9	760	1026	8	62000	Pankhola	"	237000	570600	556	9.20	60	
24.	Chhoprak	6	935	1262	11	82000	Jaukhoria Khahare & Sukaure Khola	"	129000	353300	279	4.30	64	
25.	Phinam	8	160	216	3	24000	Banspani Khola	"	13000	46800	216	3.60	60	
26.	Raniswara	1	225	304	3	48000	Bulbul Bazar	Spring	13000	47200	155	3.63	42	
27.	"	7,8,9	600	810	4	92000	Kholkhule	"	39000	125100	154	3.20	48	
28.	Bhogheni	1,2,3	1015	1370	7	143000	Sisnepani	"	52000	173900	126	3.34	37	

(Continued)

Summary On Proposed Water Supply Projects—Gorkha

Sr.#	Panchayat	Ward Nos. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
29.	Taklung		280	378	3	43000	Dharapani	"	43000	65500	173	1.52	114	
30.	Taple	9	300	405	3	33000	Dhapeagaira	"	17000	60900	150	3.58	42	
31.	"	3,5	475	641	4	50000	Khaptegaira	"	28000	102500	160	3.66	44	
32.	"	4	125	169	1	11000	Ripmool	"	7000	32200	191	4.60	41	
33.	Taku	6,7	555	749	8	78000	Bajini	Spring	86000	132200	176	1.69	10.4	
34.	"	4	305	411	2	37000	Chiuribhir-mool	Spring	12000	52800	128	4.40	29	
35.	"	2	300	405	3	19000	Gairapani	"	25000	43000	106	2.26	47	
36.	"	3	410	553	4	29000	Pokharidhara Bhakot	"	28000	88700	160	4.92	33	
37.	Saurpani	3	110	148	3	15000	Bandhara	"	6000	53200	359	8.86	41	
38.	"	4	180	243	5	26000	Gyajidhara	"	30000	48800	201	1.87	107	
39.	Simjung	3,4,5	1165	1573	8	93000	Gairapani Bajini	"	69000	123900	79	1.79	44	
40.	"	1,2	315	425	3	35000	Nimre Mool	"	21000	55900	132	1.80	73	
41.	"	6	335	452	5	31000	Bulbulepani	"	38000	84400	187	2.72	69	
42.	Barpak	3	250	338	2	34000	Mandili	"	25000	49400	146	1.97	74	
43.	Chacho		490	662	2	62000	Dhunga Chopakhola		12000	93400	141	7.78	18	

(Continued)

(Contd. of Attachment: 8.2.19)

Summary On Proposed Water Supply Projects—Gorkha

Sr.#	Panchayat	Ward Nos. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
44.	Swanra	6	185	250	5	29000	Silan Khola	"	129000	74400	297	2.56	116	
45.	Swanra		1480	1998	15	142000	Okharbotkho-lsi	Stream	129000	533200	267	4.13	65	
46.	"		85	115	1	8000	Bagedhunga	Spring	17000	33600	292	4.20	70	
47.	Swanra, Kaj-aldara, Sub scheme		220	297	2	22000	Dharapani	"	21000	50300	169	2.39	71	
48.	Swanra W/S sub project		225	304	3	22000	Kalimati Dharapani	"	21000	44000	145	2.09	69	
49.	Swanra sub-scheme		165	223	3	25000	Bajipanid-hara	"	17000	50400	226	2.96	76	
50.	Pandrug	1	240	324	3	15000	Devithan Mul Kuwapanidhara	"	12000	79100	224	6.59	37	
	Total		20905	28921	211	2627000			2692000	5985500	207	2.00	90.00	

RCU PROJECT DARAUNDI WATERSHED

GORKHA

(Projects Studied Under IRDP)

SUMMARY ON PROPOSED PROJECTS

Attachment: 8.2.2.20

Sr.#	Panchayat	Ward Nos. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
1.	Muchok	1,2,3,4, 5,9	1800	2430	13	221000	Dharapani	Spring	1730000	711400	293	4.11	71	
2.	-	6	500	675	5	62000	Jalkinikhola	Stream	112000	117900	175	1.90	91	
3.	Khoplang	5,6,8,9	1600	2160	10	196000	Deokotapan-dera Bharta-pani	Spring	129000	242900	112	1.88	60	
4.	Mareshor	6,7,8,9	1000	1350	10	122000	Benikhola	Stream	119000	201300	149	1.69	88	
5.	-	1,2	500	675	5	62000	Bindyabasini Kholsi Dhap	Spring	43000	96700	143	2.25	63	
6.	Saurpani	1,2,3,4,6,7	1800	2430	15	221000	Banchok, Banskhola	Stream	259000	375900	155	1.70	90	
7.	Manakamana	7,8,9	1300	1755	8	198000	Patle Khola	Stream	129000	266600	152	2.06	73	
8.	-	5,6	500	675	5	61000	Finamdi Padero	Spring	34000	122400	181	3.60	50	
9.	Takling	1	500	675	5	61000	Ghabari	"	86000	129800	192	2.12	90	
10.	Khanchok	1	600	810	10	75000	Gyaji Khola	Stream	43000	315500	389	7.33	53	
11.	-	5,6	240	311	4	28000	Patal Dhara	Spring	26000	71700	230	2.75	83	
12.	Bhogetini	6	400	540	5	50000	Alaiche Dhara	"	43000	102600	190	2.38	80	
13.	-	2,3,4	700	945	7	87000	Chharchhare	Stream	52000	264300	271	5.08	53	
	Total		11440	15431	102	1444000			1248000	3019000	196	2.42	80	

RCU PROJECT

KALIGANDAKI CATCHMENT

SUMMARY OF PROPOSED WATER SUPPLY SCHEME

MYAGDI

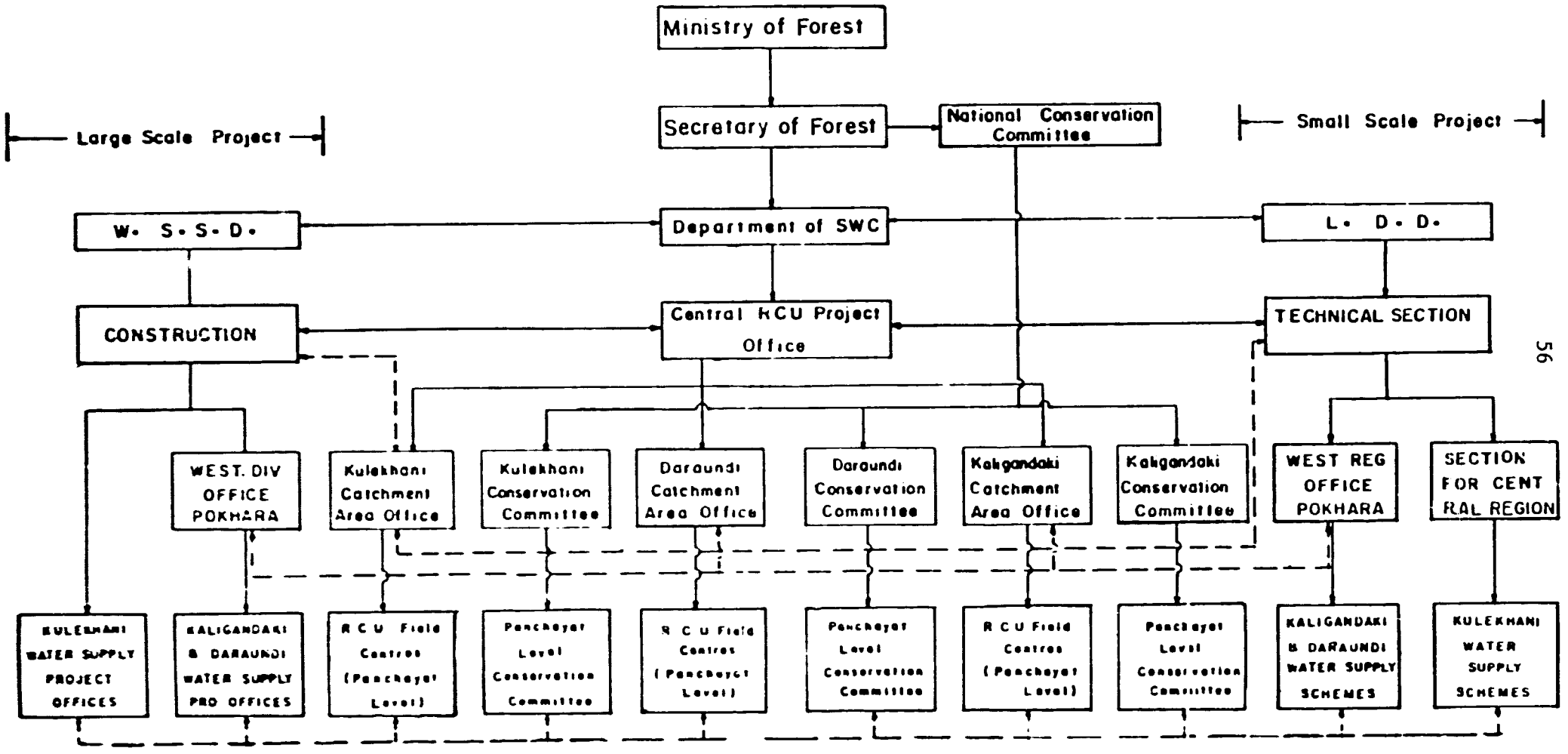
Attachment: 8.3.21

Sr.#	Panchayat	Ward Noe. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
1.	Piple	4	315	425	4	39000	Okhlapani	Spring	1640000	66100	155	1.69	92	
2.	Jheen 1	6	170	230	2	17000	Seruphetkho-la	Stream	112000	76200	331	4.48	74	
3.	Jheen 2	6,7,8,9	446	600	6	41000	Lampakha Mol	Spring	103000	74000	123	1.51	68	
4.	Chatan	1&2	641	863	6	84000	Dhunwakhola	Stream	86000	249900	290	2.97	97	
5.	Doba	9	436	586	6	55000	Tatopani Chhamara	Spring	1209000	77200	131	1.40	94	
6.	Baraha	1,2,3,4	666	897	6	106000	Seko	"	51000	190000	212	3.72	56	
7.	Rakhu-Bhagbati	5 & 9	294	396	5	42000	Jukuredhara	"	51000	111000	280	2.64	106	
8.	Rakhu-Bhagabati	2	273	395	4	48000	Ghattan Mool	"	34000	109300	277	3.21	121	
	Sub-Total		3241	4392	39	432000			3286000	953700	217	2.20	98	

MUSTANG

Attachment: 8.3.21

Sr.#	Panchayat	Ward Noe. covered	Present Population 1979	Design Population 1994	No. of Tap	Daily Water demand l/d	Name of the Source Proposed l/d	Type of the Source	Dis-charge of the source Proposed l/d	Estimate Cost Rs.	Per Capita Cost Rs.	Cost Per Litre Water Served Rs.	Per Capita Cost Water supplied l/d Gross	Remarks
1.	Chhunang(1)	5&6	394	515	2	73000	Haa Khola	Irriga-tion Channel	Sufficient Quantity	128000	249	1.75	142	
	" (2)	7	100	135	1	18000	Bhromchang	Spring	86000	78600	582	4.36	133	
	" (3)	8	90	117	2	25000	Bijayong	"	43000	73500	628	2.94	214	
2	Kagbeni	263	237	308	1	50000	Choombaman Takstaka	"	30000	82600	268	2.73	98	
3.	Marpha (1)	5,6,7,8	435	566	4	66000	Saplikholaa	Stream	26000	189200	334	2.86	117	
	" (2)	8	105	137	2	14000	Khetalepani	Spring	27000	51800	378	3.70	102	
4.	Lowang	6	132	172	2	17000	Climdhung	"	56000	32700	190	1.92	99	
5.	Kunjo	5,4,6	297	400	3	42000	Alakyubmum	"	43000	88200	221	2.10	105	
6.	Surkhang	1,2 Part	100	135	1	8000	Mustang Khola Channel	Irri. Channel	259000	47900	355	5.98	59	
7.	Chhumup	364	151	203	1	9200	Lusa Spring	Spring	3000	32100	158	11.46	14	
8.	Lomanthang	1 to 8	755	1017	4	[illegible]	Chumlaping	Spring	58000	95400	[illegible]	2.07	45	
9.	Dalome	1 to 9	1277	1665	13	95000	Thinnikhola	Irri. canal	555000	442200	306	4.65	66	Surveyed by W.S.S.D.
	Sub-Total		[illegible]	[illegible]	[illegible]	[illegible]			1248000	1342200	261	2.89	90	
	Grand Total		7316	9542	75	895200			4532000	2295900	241	2.56	93	

PROPOSED ORGANIZATION FOR WATER SUPPLY CONSTRUCTIONS

Resource Conservation and Utilization Project