

NEPAL AUSTRALIA COMMUNITY
RESOURCE MANAGEMENT AND
LIVELIHOODS PROJECT

Milestone 2: Part III -
Best Practice Example of a Second Generation
CF Operational Plan



Prepared for

AusAID

62 Northbourne Avenue
CANBERRA ACT 2601

27 June 2006

42443976

Prepared by

URS Sustainable Development
Project Managers and Consultants
Adelaide Australia

DONOR AGENCY

AusAID (Australian Agency for International Development)

62 Northbourne Avenue
Canberra ACT Australia 2601
Ph: +61 2 6206 4589

LEAD COUNTERPART AGENCY

Ministry of Forests and Soil Conservation

Singh Durbar
Kathmandu, Nepal
Ph: +977 1 4224892/4258381/4244703

NACRMLP KATHMANDU OFFICE

Maharajgunj, Ring Road
G.P.O. Box 208, Kathmandu, Nepal
Ph: +977 1 4370400/4372092/4371905

AUSTRALIAN MANAGING CONTRACTOR

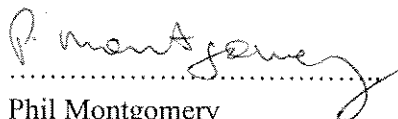
URS Sustainable Development

25 North Terrace
Hackney, SA 5069 Australia
Ph: +61 8 8366 1000

Document Authorisation

Project Manager: 
.....
Dee Hartvigsen
International Projects Manager

URS Australia Pty Ltd
25 North Terrace
Hackney SA 5069 Australia
Tel: 61 8 8366 1000
Fax: 61 8 8366 1001

Project Director: 
.....
Phil Montgomery
Project Director

Date: 27 June 2006
Reference: 42443976
Status: Final

S.N. : KAB/JA/89/12

SHREE HILE JALJALE 'Ka' CFUG
Ghimire Gaon, Tukucha VDC
Ward No: 6 & 7
Kabhre Palanchok

Community Forest Operational Plan
(Third Revision)

1 March, 2006 - 15 July, 2011

Community Forest Operational Plan (Third Revision)

1 March, 2006 - 15 July, 2011

Code Number : KAB/JA/89/12
Area (Hectare) : 118.14
House Holds (Number) : 243
Block (Number) : 5
Sub Block (Number) : 27

Prepared by:
Shree Hile Jaljale “Ka” CFUG
Ghimire Gaon, Tukucha VDC
Ward No: 6 & 7
Kabhre Palanchok

Supported by:
***Mr. Shiva Prashad Ghimire* - OP Facilitator, Hile Jaljale Ka CFUG**
***Ms. Anchala Ghimire* - LIP Facilitator, Hile Jaljale Ka CFUG**
***Mr. Shiva Ram Thapa* - Ranger, Janagal Range Post**
***Mr. Dilli Bhattarai* - Ranger Janagal Range Post**
***Mr. Dhurba Thapa* - Forest Guard, Janagal Range Post**

March 2006

**Contract between Shree Hile Jalajale ‘Ka’ Community Forestry User Group
and District Forest Office, Kabhre Palanchok**

We, the Shree Hile Jalajale ‘Ka’ Community Forestry User Group (CFUG), hereby agree to protect, manage and utilise the handed over community forest as per this approved operational plan. We reside in Tukucha, Wards Nos. 6 and 7, Kabhre Palanchok District, Bagmati Zone, and our community forest covers a total of 118.14 ha in three discreet forested areas. It is bounded in the east by Hile Jaljale “B” Community Forest, in the west by Neure Creek and the fields of Chhabilal Ghimiri and Lal Krishna Ghimiri, in the north by the land survey office and Devidhunga, and in the south by the fields of Chabilal Ghimiri, Ram Prashad Ghimiri, Rajnat Ghimiri and Budhi Prashad Ghimiri. We submit these unanimously agreed upon terms and conditions to the District Forest Office (DFO) of Kabhre Palanchok with our commitment to follow them. If any term or condition is violated, we are ready to bear responsibility according to the Forest Act of 2049 and the Forest Regulations of 2051. Of our own volition, we submit this contact to His Majesty’s Government (HMG) through DFO.

Terms and conditions:

1. We, the CFUG, view this operational plan (OP) as a plan for sustainable forest management.
2. We, the CFUG, will implement no forest-based activities other than those specified in the approved Operational Plan.
3. We, the CFUG, will tolerate no encroachment on or destruction by any means of the handed over community forest or other forest areas.
4. We, the CFUG, will follow the technical suggestions, recommendations and directives given to us by DFO, Ilaka Forest Office and Range Post.
5. We, the CFUG, will submit to the DFO a progress report in the required format within one month after each fiscal year ends.
6. We, the CFUG, will prepare and send an audit of the CFUG fund to the DFO annually.
7. We, the CFUG, will consult our constitution and OP while carrying out every CFUG activity.
8. We, the CFUG, will encourage every CFUG member to participate in CFUG discussions.
9. We, the CFUG, will maintain records of any change in key positions in the executive committee (EC) or in the property of the CFUG.
10. We, the CFUG, will select people who are committed to learn and teach others to participate in training programs, workshops and visits.
11. We, the CFUG, will accept any action taken against us for not following or not being capable of implementing our OP or for carrying out any activity that damages the environment.
12. We, the CFUG will not catch or kill any wildlife in violation of the National Park and Wildlife Conservation Act of 2029. We will assist in catching violators when possible.
13. We, the CFU, will help forestry staff visiting the field to inspect community forestry (CF) activities.
14. We, the CFUG, understand that the DFO will not be responsible for providing financial support for OP preparation or revision.

15. We, the CFUG, understand that the DFO will not be responsible for the success or failure of any enterprise activity mentioned in this plan.

Recommendation

Name of Ranger : Mr. Dilli Bhattarai
Signature :

Address : Janagal Range Post, Janagal
Date :

Signed on behalf of the CFUG

Signed on behalf of the DFO

EC Chairperson's name

Mr. Bal Ram Ghimire

DFO's name

Mr. Shanta Muni Tamrakar

EC Chairperson's signature

DFO's signature

Date

Date

Seal

Seal

CONTENTS

Acronyms	iv
1 Introduction	1
2 The History and Current Situation	2
2.1 Historical Background of Community Forestry.....	2
2.2 Review of Current Operational Plan	2
2.3 Legal Environment.....	3
2.3.1 Some Important Legal Provisions in Community Forestry	3
2.4 The Human Environment.....	6
2.4.1 Livelihood Activities	6
2.4.2 Status of Human Resources and their Availability	12
2.5 The Forest Environment	13
3 Objective and Strategy	17
3.1 Shared Objective	17
3.2 Strategy	17
4 Spatial Organisation of the Forest	18
4.1 Pine Plantation Working Circle	18
4.2 Pine Conversion to Broadleaf Working Circle.....	19
4.3 Protection Working Circle	19
4.4 Orchard Working Circle	19
4.5 Wetland Working Circle	19
4.6 Ecotourism Working Circle	20
4.7 Coppice with Standard Working Circle	20
5 Program Activities	21
5.1 Activity 1: Natural Resource Management.....	21
5.2 Activity 2: Social Change through CFUG-Capacity Building	29
5.3 Activity 3: Physical Infrastructure Development.....	31
5.4 Activity 4: Income Generation.....	32
5.5 Activity 5: Human Resource Development	35
6 Forest Products Utilisation Plan	46
6.1 Illegal Cutting of Forest Products.....	47
6.2 Grazing	47
6.3 Forest Fire	47
6.4 Hunting	47
6.5 Erosion Control.....	48
6.6 Encroachment Control	48

6.7	Pest and Disease Control.....	48
6.8	For Consideration by the Executive Committee during OP Implementation	48
7	Fine and Punishment	49
7.1	Process of Fine and Penalty.....	49
7.2	Delegation of Right and Responsibility for Fine and Penalty.....	49
7.3	Fine and Penalty.....	49
7.4	Absence in Participation.....	50
7.5	Misuse of Fund.....	50
7.6	Right to go to Court.....	50
8	Monitoring and Evaluation	51

TABLES

Table 1:	Status of income and expenditure (2002-2005) in NRs.....	3
Table 2:	Ethnic group/caste composition of CFUG	6
Table 3:	Description of interest groups according to livelihood indicators.....	7
Table 4:	Seasonal calendar.....	9
Table 5:	Livelihood situation and issues of different interest group.....	10
Table 6:	Status of human resources and their availability	12
Table 7:	Business prioritisation summary.....	14
Table 8:	Description of forest area	16
Table 9:	Working circles	18
Table 10:	Anticipated CFUG income and expenditure and labour market creation.....	21
Table 11:	Pine plantation management according to thinning regime.....	23
Table 12:	Forest management according to annual allowable cut	24
Table 13:	Shrubland management activity schedule.....	26
Table 14:	Description of employment opportunities generated by the CFUG log sale business.....	33
Table 15:	Profit and loss statement of log sale business from 2006-2010.....	33

Table 16: Description, schedule and budget of all program activities.....	37
Table 17: Forest products sales and distribution.....	46
Table 18: Fine and penalty.....	49

FIGURES

Figure 1: Institutional assessment of the CFUG EC by blacksmiths, women and the EC themselves (2006).....	13
Figure 2: Shree Hile Jaljale 'Ka' CF General Map.....	15
Figure 3: Proposed CFUG staffing.....	31

Annexes

Annex 1: CF Working Circles	
Annex 2: Resource Identification and Availability Matrix	
Annex 3: Market Analysis Matrix	
Annex 4: Business Prioritisation Matrix	
Annex 5: Business Plan for Log Sale Business, Hile Jaljale 'Ka'	
Annex 6: Block and Sub-block Division and Present Status of Regeneration Pole and Tree	
Annex 7: CFUG Inventory Data	
Annex 8: Resource Inventory Map Showing Sample Plots	

Acronyms

ADRA Nepal	Adventist Development and Relief Agency, Nepal
AEC	Agro Enterprise Nepal
AFO	Assistant Forest Officer
AMC	Australian Managing Contractor
ATL	Australian Team Leader
AusAID	Australian Agency for International Development
BDS	Business Development Services
BOGs	Basic Operating Guidelines
BP	Business Plan
CAFO	Chief Administrative/Financial Officer
CAP	Community Awareness Program
CBO	Community Based Organisation
CCI	Chamber of Commerce and Industry
CD	Community Development
CDA	Community Development Adviser
CDG	Community Development Group
CEBUD	Centre for Business Development
CF	Community Forestry
CFT	Community Forestry Technician
Cft.	Cubic Feet
CFUG	Community Forest User Group
CLC	Community Learning Centre
CM	Community Motivators
CRFTC	Central Regional Forestry Training Centre
DADO	District Agriculture Development Office
DAG	Disadvantaged Group
DCC	District Coordination Committee
DDC	District Development Committee
DEO	District Education Office
DFCC	District Forestry Coordinating Committee
DFO	District Forest Office/ Officer
DLS	Department of Livestock Services
DLSO	District Livestock Services Office / Officer
DNH	Do No Harm
DoF	Department of Forests
DSBCIO	District Small Business and Cottage Industry Office
DSCO	District Soil Conservation Office / Officer
DSCWM	Department of Soil Conservation and Watershed Management
EC	Executive Committee (of CFUGs)
EDBM	Enterprise Development and Business Management
EDBP	Enterprise Development and Business Planning (facilitators)
FECOFUN	Federation of Community Forestry Users Nepal
FNCCI	Federation of Nepalese Chambers of Commerce and Industry

FRC	Forage Resource Centre
FSCC	Forestry Sector Coordination Committee
FSPSES	Final Stage Plan & Sustainable Exit Strategy
GAD	Gender and Development
GG	Good Governance
GoN	Government of Nepal
GPSE	Gender, Poverty and Social Equity
GSE	Gender and Social Equity
HASP	Health and Safety Plan
HPPCL	Herbs Production & Processing Company Ltd
HRD	Human Resource Development
INGO	International Non Government Organisation
IoF	Institute of Forestry
IOP	Integrated Operational Plan
IUCN	The World Conservation Union
JABAN	<i>Jadibut</i> (medicinal plant) Association of Nepal
KP	Kabhre Palanchok
LEP	Lesser Experienced Professional
LFP	Livelihoods & Forestry Program
LIP	Livelihood Improvement Plan
LUM	Land Use Management
M&E	Monitoring and Evaluation
MEDEP	Micro Enterprise Development Project (UNDP)
MFSC	Ministry of Forests and Soil Conservation
MoES	Ministry of Education and Sports
MOU	Memorandum of Understanding
MWCSW	Ministry of Women, Children and Social Welfare
m ³	Cubic Meter
MT	Metric Ton
NACRMLP	Nepal Australia Community Resource Management and Livelihoods Project
NACRMP	Nepal Australia Community Resource Management Project
NFEC	Non Formal Education Centre (more recently a department of MoES)
NGSP	Non Government Service Provider
NRM	Natural Resource Management
NTFP	Non Timber Forest Product
NTRMC	National Training Resource Mobilisation Centre
OP	Operational Plan
PCC	Project Coordination Committee
PCR	Project Completion Report
PD	Project Director
PDD	Project Design Document
PMC	Project Management Committee
PPRs	Project Progress Reports
PRA	Participatory Rural Appraisal
PRSP	Poverty Reduction Strategy Paper

PSU	Program Support Unit
RP	Range Post
RRA	Rapid Rural Appraisal
SCDS	Senior Community Forestry Development Specialist (of NACRMLP)
SEDC	Safe and Effective Development in Conflict
S/GE	Social & Gender Equity
SEAAP	Social Equity Awareness and Action Program
SFM	Sustainable Forest Management
SFMS	Senior Forest Management Specialist (of NACRMLP)
SMT	Simplified Monitoring Toolbox
SNRM	Sustainable Natural Resource Management
SP	Sindhu Palchok
STA	Short-Term Adviser
TAG	Technical Advisory Group
TL	Team Leader (International Team Leader)
TNA	Training Needs Assessment
TO	Training Officer
'Tole'	Administrative Unit (sub-division of a village)
TOR	Terms of Reference
ToT	Training of Trainers
URS	URS Sustainable Development
VAHW	Village Animal Health Worker
VDC	Village Development Committee
WC	Working Circle
WDO	Women Development Office
WEP	Women Empowerment Program
WS	Workshop

1 Introduction

This OP, prepared by CFUG members, integrates three components:

1. Livelihoods, gender and social equity, good governance and conflict sensitivity
2. Business development planning
3. Sustainable natural resource management systems

Every household has been assigned to a single ‘interest group’ according to its single major source of livelihood and the livelihood strategies and Community Forestry (CF)-related interests of each group have been elucidated. The forest has been inventoried according to the community forestry inventory guidelines and a schedule of silvicultural thinning has been prescribed according to the Project’s guidelines (NACRMLP 2005), which, in fact, are being piloted in the area. The sale of logs cut during thinnings will be the major business activity of the Community Forest User Group (CFUG), and the funds generated from this business will finance substantial broad-based and equitable livelihood improvements according to the expressed wishes of the community.

2 The History and Current Situation

2.1 Historical Background of Community Forestry

The Hille Jaljale ‘Ka’ Community Forest was granted to Punyakhar Upadhaya Ghimire for management by the then Rana Prime Minister as *birta*¹. It was bounded by the Thulo Khola in the east, Punya Mata in the west, Ratna Chandeswar temple in the north and the confluence of the Thulo Khola and Punya Mata in the south. The forest was named after Hile Khola (stream) and Jaljale (wetland). The forest was reportedly in good condition before it was heavily damaged during an earthquake in 1933 (1990 B.S.) and then further destroyed by heavy snowfall in 1943 (2000 BS). The remaining trees were felled and sold after the introduction of democracy in 1950 (2007) brought about the abolishment of the *birta* system and the nationalisation of all forests. A landslide in 1955 (2012 BS) further damaged the area. According to village elders, the forest was then a denuded hill.

During the 1970s the area was reforested with *Pinus patula* and *Pinus wallichiana*, plantations and fenced with barbed wire in a joint venture of the Government of Nepal (GoN) and the Australian Government. A motorable road into the area was constructed in 1982 (2039 BS).

A total of 75 ha of forest was handed over to the community as a CF in 1990 (2047 BS). When the CFUG’s OP was first renewed in 1997 (2054 BS), more forest was included, bringing the total area to 111.2 ha. The OP was renewed for a second time in 2001 (2058 BS); it incorporated an institutional and a community development plan. Unfortunately, many of the activities planned had no budget allocation and could not be implemented. The forest was, however, well protected and some thinning operations were conducted. Income generated by selling harvested pine logs has been invested in the local school, drinking water supply and some forest roads.

The previous OP however did not provide fully for the empowerment of women, the poor and dalits to become meaningful participants in decision-making forums, did not provide adequately for investment in income-generating activities; and local-level human resource development.

Without the knowledge of the Hie ‘Ka’ CFUG, 17.12 ha of its forest (see Figure 2) was given to the Department of Cadastral Survey of Nagarkot by the Cabinet Level Decision of GoN. The current OP revision identifies this land as a ‘conflict zone’.

2.2 Review of Current Operational Plan

The over view of the previous operational plan showed that CFUG was more protection-oriented than carrying out active forest management according to given prescriptions in the OP. So far, they have harvested 2771 pine trees (total volume 21,088 cft) in all blocks. Trees were removed according to annual allowable cut concept instead of thinning regimes. Forest management was done in the same period of time as prescribed in the OP except in block number four which was carried out in FY 2061/062 (B.S.). Women’s

¹*Birta* is land granted to influential public persons by the government

participation was weak in forest management, however, poor; disadvantaged groups were included in forest management activities.

After meeting the internal demand of CFUG; providing timber for disaster affected users; and school and local club; harvested timber was sold outside the CFUG.

The following table shows the status of income and expenditure of the CFUG for last four years.

Table 1: Status of income and expenditure (2002-2005) in NRs

Fiscal year	Opening balance	Income	Expenditure	Closing balance	Remarks
2058/059 (2002)		121,913*	40,044	81,869	Audited
2059/060 (2003)	81,869	81,579	28,433	135,015	Audited
2060/061 (2004)	135,015	220,463	133,294	222,184	Audited
2061/062 (2005)	222,184	865,844	602,024	486,004	Provisional

* This is the sum of the opening balance and income for 2002.

The income of the CFUG has increased gradually over the last four years. The CFUG has made highest income (about NRs 263,819) in year 2005. The total net savings of the CFUG in 2005 was about NRs 486,000. Regularity in auditing also indicates that the CFUG is well aware of financial transparency.

2.3 Legal Environment

The Forest Act of 18 January, 1993 is the latest forestry legislation; as envisaged in the Constitution of 1990; it provides legal measures for protecting forests and involving local people in the conservation and development of forest resources. The Act builds upon the policy directives laid out in both the Master Plan for the Forest Sector and the Eighth Plan. In enacting the new Forest Act 1993 and Forest Rules and Regulations of 1995, GoN has shown its commitment to the institutionalisation of the CFUGs by recognising them as legal entities.

2.3.1 Some Important Legal Provisions in Community Forestry

Handing Over Procedure

The Forest Act of 1993 empowers DFOs to hand over any part of a national forest to a CFUG as a community. The CFUG is then entitled to develop, conserve, use and manage this forest and to sell and distribute forest products by independently fixing their prices as specified in its OP (Sections 25 (1) of Act).

Handing over a national forest to a community does not, however, change ownership, which remains with GoN (Section 67 of Act).

Establishment and Registration of CFUGs

Forest users who seek to develop and conserve their community forest and to use forest products for collective benefit may form a CFUG by following the various procedures prescribed in the Forest Regulations of 1995 (Section 41 of Rules).

A registered CFUG is an autonomous and corporate body with perpetual succession. Every CFUG must have a distinct seal. Like an individual, it is entitled to acquire, use, sell, transfer or otherwise dispose of movable or immovable properties and may sue or be sued in its own name (Section 43 of Act).

Preparation and Amendment of OPs

A CFUG is required to prepare an OP for the management of its forest. The DFO is required to provide technical and other assistance as required. Section 26 (1) of the Forest Act empowers a CFUG to make timely amendments to its CFUG as needed. It is required to inform the DFO about any changes made.

If the DFO feels an amendment is likely to have a significant adverse effect on the environment, it, within 30 days of notification, may direct the CFUG not to implement it.

Community Forestry User Group Fund

A CFUG is entitled to have a separate fund of its own. The fund consists of grants received from the government; grants, donation or assistance received from any individual or institution; income received from the sale and distribution of forest products; and money collected through fees, fines and other sources. The CFUG is empowered to spend the money in non-forestry sectors for public benefit after allocating funds for CF (Section 45 (3) of Act). Section 30(a) of the first amendment of the Act requires a CFUG to spend at least of 25% of their income on the development, conservation and management of its community forest.

Transactions involving a CFUG fund require the joint signature of two designated (Rule 36(1)). The annual accounts of income and expenditure must be audited by a person or institution designated by the CFUG (Rule 36(2)). A copy of the audit must be submitted to the concerned DFO.

Activities Prohibited in Community Forests

In addition to those activities prohibited in its OP, no CFUG may undertake any of the following activities (Rule 31(1)):

- Destroy the forest, mortgage or otherwise transfer the ownership of the land
- Clear forest area for agricultural purposes
- Build houses
- Take any action which may cause soil erosion
- Extract transport rocks, soil, boulders, pebbles, or sand

Buildings needed for security may be built with the approval of the DFO (Rule 31(2)).

Collection, Sale and Distribution of Forest Products and Establishment of Forest-Based Industries

A CFUG can only collect, sell and distribute those forest products specified in its OP. After forest products are harvested, a CFUG must arrange for reforestation or other rehabilitation as soon as possible. A CFUG must inform the DFO about the selling price of forest products. A CFUG may run forest-based industries outside the community forest after obtaining approval from the relevant agency on the recommendation of the DFO (Rule 32). Rule 31(2) allows a CFUG to mortgage forest products with the approval of the DFO if it needs collateral for a loan to develop the forest. It also allows the free marketing of forest products.

Transportation of Timber outside a Community Forest

A CFUG must register a hammer mark with the DFO in order to transport timber outside its forest. After receiving an application, the DFO must register the mark free of cost to ensure that it will not be duplicated. A CFUG-designated person or committee must mark timber to be transported and issue a permit. The DFO must be informed in advance and the transport must be endorsed by all check posts located along the route. Forest products other than timber may be transported only after the DFO is informed and a CFUG-designated person or committee issues a permit.

Submission of Report to DFO

Section 44 of the Forest Act requires a CFUG to submit an annual report on its activities to the DFO within one month of the end of the financial year. It must specify the financial details and the situation of the community forest as prescribed. DFOs are empowered to make suggestions to CFUGs on the basis of these reports.

HMG's Right to Use CF Land

Section 3 of the Land Acquisition Act of 1977 empowers the government to acquire any amount of land for the sake of public interest after compensating the owner. Other legislation like the Electricity Act of 1992 and the Water Resource Act of 1992 has similar provisions.

Section 68(1) of the Forest Act of 1993 also gives the state the power to use any part of a CF if it involves an issue of national priority, if there is no alternative and if there will be no significant adverse effect on the environment.

Local Issues

After the OP of Hile Jaljale 'Ka' was revised in 2001 (2058), a Cabinet-level decision of April 2002 (21 Chaitra, 2058 BS) transferred 17.12 ha to the Department of Cadastral Survey of Nagarkot without the CFUG's knowledge (see Figure 2). The Department did not allow the CFUG to implement those aspects of its OP related to that area even though Section 67 of the Act allows a CFUG to manage the forest products of a state-owned forest.

When a high voltage electricity transmission line (see Figure 2) was introduced in 1988 (2045 B.S.), the Nepal Electricity Authority (NEA) felled trees in a 10-metre-wide swathe below the cable. Initially, the NEA managed the annual clearing of this area with CFUG representatives, but in 2005 (2061 BS), the CFUG did it themselves.

2.4 The Human Environment

The CFUG comprises 243 member households residing in 11 *toles*². Most (90%) belong to the Ghimire clan of the Brahmin caste. The remaining 10% are Kami, Damai, Newar, and Bhujel. There is one Chetri household.

The CFUG EC is composed of 11 Ghimire men. No women or other disadvantaged groups are represented.

Table 2: Ethnic group/caste composition of CFUG

Ethnic group/caste	No of Households	No. of males	No. of females	Total population
Brahmin/ Chetri	219	697	703	1400
Kami (blacksmiths)	13	29	22	51
Damai (tailors)	7	17	12	29
Bhujel	2	5	4	9
Newar	2	2	3	5
Total	243	750	744	1494

2.4.1 Livelihood Activities

The farming system of the CFUG members is an integrated mixture of livestock, crop and forestry. It is largely subsistence level and labour-intensive. The labour force required for the maintenance of the farm is almost exclusively supplied from the farm household.

The farmers' small, fragmented plots of farmland are broadly classified as irrigated lowland (*khet*) and rain-fed upland (*bari*). Irrigated land is used intensively for cereal crop cultivation, while rain-fed land is used for growing cereal crops, grasses and trees. A third land category, private forest (*kharbari*) is used to grow thatch, fuel wood, fodder and timber, but not crops.

Agriculture and livestock are the main sources of livelihood for most households. Good road access to the markets of the cities of Bhaktapur and Kathmandu allow farmers to profit from growing high-value cash crops such as potatoes, cauliflower, cabbage, beans, and broad-leaved mustard. Potatoes are the predominant commercial cash crop; most households earn NRs. 50,000 to NRs 100,000 per year from potato sales. Paddy, maize, wheat and finger millet are the major food crops.

As in other hill areas, livestock is an essential component of the farming system; animals provide manure, food and cash income. Buffalo, cattle and goats are raised by nearly all households. Cattle and buffaloes are kept for dairy production; in fact, milk and milk products are a major source of animal protein in the villagers' diets. The sale of milk is also a major source of income for most households. There is also significant informal processing of dairy products at the household level.

² *Toles* are small settlements.

Animals are fed straw, crop residues, fodder and grass in their stalls. Since, the local supply of grass and fodder is insufficient; households which do not own private forest invest substantial proportions of their income in purchasing straw from Bhaktapur.

Forestry is the third key component of the agricultural system. Users meet their need for forestry products by exploiting community as well as private forests. Most households have also protected naturally growing or planted tree species around their homesteads and in their fields for multiple purposes, such as fodder, fuel wood, fruits, and timber.

Although most CFUG members engage primarily in agriculture, a few have other occupations, including government service, school teaching, shopkeeping, wage labour, and artisanship.

While some relatively wealthy households (11%) have irrigated paddy, sloping terraces and their own forest, most (63%) have irrigated paddy fields and sloping terraces but no private forest. Poor households (21%) have only sloping terraces. Those who do not own land (2%) and the blacksmiths (4%) tend to be the poorest; they experience seasonal food insecurity, lack access to potable water and cannot educate their children.

Table 3: Description of interest groups according to livelihood indicators

Name of interest group (by livelihood category)	No. of households	No. of households with year-round food security	No. of households with all school-age children (6-16) in school full-time	No. of households with toilets	No. of households with individual tap stands for piped water
With irrigated and rain-fed land and private forest	26	All	All	All	Most
With rain-fed and irrigated land	152	All	All	Most	Some
With only rain-fed land	51	All	All	Most	Some
Landless	5	None	Only up to primary level	Most	None
Blacksmiths	9	None	All	Most	None

Households with irrigated and rain-fed land and private forest

Agriculture and livestock are the main sources of livelihood and farmland the most important source of income and employment. The demand for fodder and grass is met largely by private forests. On-farm food production provides 9-12 months of food security and farmers earn cash income by selling farm produce. Some members of this group are engaged in government service. This relatively well-educated group plays an active role in the CFUG.

Households with irrigated and rain-fed land

These households own some irrigated and some rain-fed land. Food production on their own land meets 3-12 months of their requirements and most earn cash by selling milk and potatoes. Some have opened small teashops in the village, while others earn income through providing skilled labour in carpentry and wage labour.

Households with rain-fed land only

Diverse sources meet the livelihood needs of this group. Households vary in the grain sufficiency of their own farm production from 3-10 months. Most do not rely solely on farm production because they have few land assets; they depend on employment instead. Some engage in agriculture and earn cash from potato and milk sales. Some have opened small teashops in the village.

Landless

Five household of the Hille 'Ka' CFUG have no land at all. They earn their living mostly by wage labour or by farming the land of wealthier people (*andhiya*). In this system they have to give the landowner half of what they produce. Two of the five have temporarily migrated to Kathmandu for labour work.

Blacksmiths

The main occupation of this group is metal-working. They make and repair agricultural tools like sickles, spades, ploughs, as well kitchen utensils. They are paid annually for their services in food grains in a system called *balighare*. Agriculture is their secondary occupation; it meets only 2-4 months of food requirements.

Seasonal livelihood activities

The lives of all CFUG members revolve around the seasonal calendar (see Table 4). Besides selling potatoes, the major commercial crop, and large quantities of buffalo milk, farmers produce and sell mustard, wheat and vegetables commercially.

For the landless and blacksmith groups, April and July are the main periods of food insecurity as they wait first for the potato harvest and then for the maize harvest. The landless are dependant on agriculture because they share crops with wealthier landholders, while blacksmiths are traditionally paid in kind for services rendered throughout the year in agricultural produce at the time of harvest.

Unemployment amongst young men was perceived by at least one key informant as a major social problem. While the situations of individual households vary widely according to the size of their land holdings and family size, most farmers report being relatively free between February and March, when there is little to do on farms.

Table 4: Seasonal calendar

Activities	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Jun
Crop cultivation on <i>bari</i>	Harvesting maize and cultivating potatoes		Weeding potatoes		Harvesting potatoes	Sowing mustard, and wheat			Harvesting mustard and wheat and sowing maize			
Crop cultivation <i>khet</i>		Harvesting paddy, cultivating potatoes				Harvesting potatoes	Cultivating 2 nd potato crop			Harvesting potatoes and starting paddy cultivation		
Income generation					Selling potatoes of <i>bari</i>	Selling potatoes of <i>khet</i>			Selling mustard and wheat	Selling potatoes		
Problem	Food insecurity, shortage of irrigation water	Disease: fevers and headaches								Food insecurity		
Main festivals	Saune Sangrati, Janai Purnima	Father's Day, Teej	Dashain	Tihar			Magha Sangrati	Holi	Chaitre dashian	Nepali new year		
Agricultural work load	Busy	Busy	Busy	Busy	Busy	Busy	Free	Free	Free	Busy	Busy	Busy
Activities carried out in forest	Forage seed sowing, fodder planting, collection of fodder and grass	Grass and fodder collection		Weeding and leaf litter collection	Firewood, grass, fodder, and leaf litter collection	forest management; firewood, grass, fodder and leaf litter collection; protection of forest from fire by clearing along road in March				Leaf litter collection		Grass cutting, plantation, and seed sowing

Table 5: Livelihood situation and issues of different interest group

Interest group	House-holds	Ave. Livestock / HH			Issues and problems faced in various livelihood assets				
		Cow	Bufs ¹	Goat	Natural	Physical	Human	Social	Financial
Households with irrigated and rain-fed land and private forest	26	1.3	2.3	3.5	Shortage of fodder, forage, leaf litter and bedding materials Shortage of drinking and irrigation water Traditional livestock farming system: high input but low output Expenditure on chemical fertiliser and pesticides	Lack of water conservation ponds to harvest rain water for irrigation purposes Lack of community hall for group meetings	Lack of knowledge about how to improve the condition of private forest for fodder and grass production	Problems for pregnant women and other ill people due to the lack of a health post Lack of veterinary services in the village	
Households with only irrigated and rain-fed land	152	1.5	2.8	3.2	Shortage of fodder and forage	No drinking or irrigation water	Prolapsed uterus a problem with most of women	Women with prolapsed uteruses are shunned	Lack of money for treatment for prolapsed uterus (operation)
Households with rain-fed land only	51	1.4	1.3	1.6	Shortage of fodder and forage	Lack of community building	Lack of knowledge about vegetable farming and the proper use of chemical fertiliser	No representation of women, poor or Dalit on the CFUG EC; low participation of these groups at CFUG meetings	Lack of money for income-generating activities
Blacksmith	9	0	0.7	1.6	Shortage of fodder, forage, leaf litter and bedding materials Cannot afford CFUG timber Lack of charcoal for metal-working; digging out tree stumps is laborious Desire to manage and utilise <i>kaphal</i> , <i>guras</i> and <i>agare</i> for charcoal production	Problem of drinking water and water for irrigation	Lack of knowledge and skill for metal-working for commercial purpose	Lack of participation in decision-making due to no representation on the EC	Lack of financial resources for initial investment for metal working for commercial purposes Difficulty in paying high interest rate if loans taken from CFUG
Landless	5	0.6	0.2	1.8	Shortage of fodder, forage, leaf litter and bedding materials Lack of land to produce income-generating crops Cannot afford CFUG timber	Poor condition of houses Cannot afford CFUG timber	Lack employment Lack of knowledge about improved vegetable farming and goat-raising to generate more money	No representation in CFUG EC Different wage rate for males and females for equal work	Lack of money to pay for school Lack of money to invest in vegetable farming and goat-raising

All interest groups report a shortage of forage and fodder on both CF and private land (Table 3 and Table 4). To solve this problem, the CFUG wants to convert the pine forest into a broadleaf forest and to introduce forage and fodder species to CF and private land. The lack of irrigation facilities, the decline in soil productivity and the inaccessibility of veterinary services are other problems common to all.

All users pay NRs. 30 per cubic foot of timber, a subsidised rate still prohibitively expensive for poor households. All groups agree that the price of timber price for outside sales is reasonable.

The CFUG charges NRs. 5 per *bhari* of firewood. The supply suffices, but seems quite expensive for the landless. Firewood collection is open only for four months, from Kartik to Magh. A user who does not collect enough wood then will experience a shortage. The poor suffer from this restriction. For the Kami, who need charcoal for metal-working, the roots and stumps of fallen trees they are provided is not enough. They would like to be able to use *kahpal*, *angeri*, and *gurans* as these species are not suitable for use as timber.

Drinking water is another problem faced by some *toles*.

Lack of access to basic agricultural and veterinary services is a serious concern for most households.

The Kami want to develop their skills in metal-working. They also have problems coming up with the capital for copper work.

Some farmers and the landless do not have enough money for vegetable farming. They would like support from the CFUG fund in the form of a loan, subsidy or grant.

Gender and equity issues

Groups of women, the Kami and the landless group are concerned that they are not represented in the EC. They would like to be able to raise their voices and to participate at the policy level.

These groups also are concerned about health and sanitation. Women, in particular, worry about pregnancy, uterus prolapse and sexually transmitted diseases. When the extraordinarily heavy workload of women leads to uterus prolapse and treatment is unavailable, women suffer from ostracism.

2.4.2 Status of Human Resources and their Availability

The CFUG has a wealth of human resources (see Table 6).

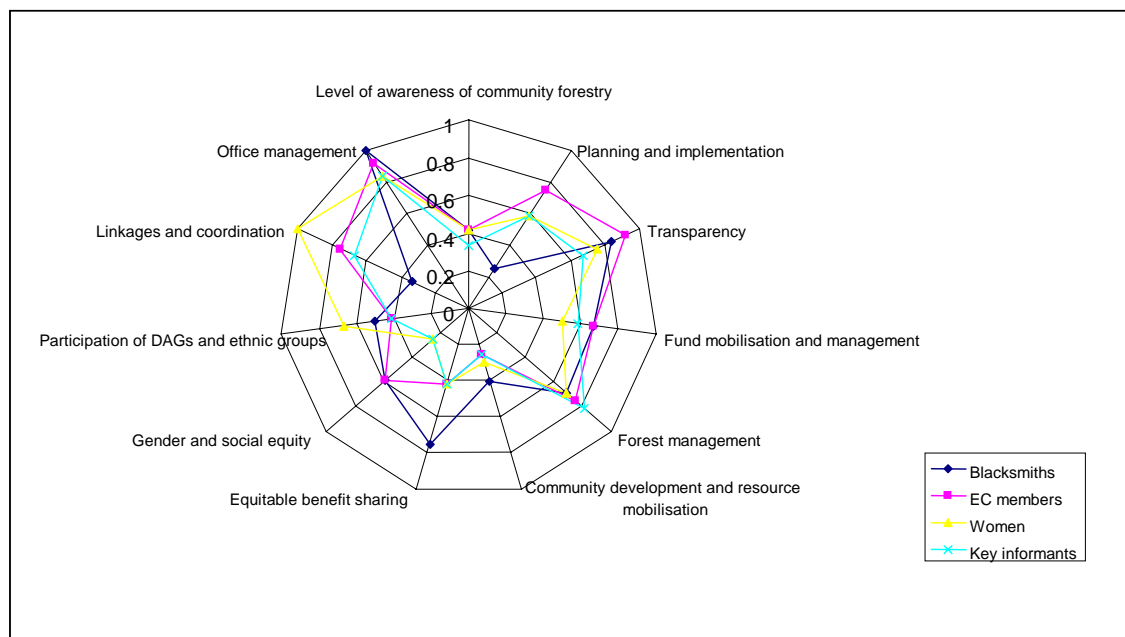
Table 6: Status of human resources and their availability

Local human resource	No.	Present status and availability
Medicinal herb and agricultural assistant	6 men	Service provided as per need and capacity within and outside the CFUG area
Mushroom cultivation	2 men	No market for mushrooms though skills for cultivation known
Literacy facilitator	4 women 10 men	Work only during literacy program implementation
Improved stove (smokeless)	2 women	Mobilised within CFUG areas
Woman health worker	3 women	Mobilised within CFUG areas
Sewing clothes	5 women	Work is ongoing
Drinking water maintenance worker	2 men	Work as per needs
Beekeeping	5 men	Have started selling honey
Motorcycle repair and maintenance	1 men	Work as a means of livelihood
Driver (tractor and motor)	9 men	Work continuously
Fortune Teller (Jyotishi)	6 men	Work within and outside CFUG area
Stone cutter using modern techniques	4 men	Service provided within and outside village
HIV/AIDS and first aid treatment health worker	3 men	Raise awareness in village
Women empowerment facilitator	1 man 7 women	Work as WEP facilitators
OP preparation facilitator	1 man 1 woman	Actively involved in OP revision
Bamboo basket maker	19 men	Sell bamboo baskets within and outside village
Mason and carpenter	6 men	Work in house construction works
Agricultural tool maker	4 men	Mobilised within CFUG area
Gold and silver ornament maker (curio)	2 men	Work in Kathmandu
Occupational sewing	4 men	Mobilised within village
Carpenter	4 men	Make wooden furniture and sell locally

Institutional assessment of CFUG

Institutional assessments of the CFUG EC carried out by blacksmiths, women groups and the executive committee themselves are broadly similar; they suggest there is a high level of achievement in office management, transparency and forest management (see Figure 1). The evaluations do suggest, however, that there is room for improvement in community awareness about the CFUG, gender and social equity, and fund mobilisation for community development.

Figure 1: Institutional assessment of the CFUG EC by blacksmiths, women and the EC themselves (2006)



2.5 The Forest Environment

The forest comprises one major (106.36 ha) and two minor (9.37 ha and 2.41 ha) discreet areas (see Figure 2) and is one of a series of 10 largely contiguous CFUGs (total area 390 ha) below Nagarkot in Kabhre District whose denuded slopes were reforested during the early 1970s. It protects the gently undulating terrain of the upper catchments of the Dgundra Khola and the Thulo Khola. It contains highly valuable pine plantations and is an important source of drinking water, irrigation water, forage, fodder, livestock bedding material, and agricultural land nutrient recharge for its downstream hill-farming CFUG member households.

Seventy ha is largely dominated by *P. patula* that was planted in or around 1975 and a further 33 ha is dominated by *P. wallichiana* that was planted in or around 1971 (see Table 8 and Annex 6). These species appear to be well suited to the site and are growing vigorously. Whilst it is not possible to estimate mean annual increment (MAI) because there have been a lot of unrecorded previous removals, remaining growing stock indicates MAI's well in excess of $9 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$ for *P. patula* and well in excess of $11 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$ for *P. wallichiana*. While these plantations have been thinned, they remain largely overstocked from the perspective of the commercial production of sawlogs and grass and shrub development.

For inventory and management purposes, the forest has been divided into permanent blocks (using permanent landscape features) and semi-permanent sub-blocks (with homogeneous forest types and conditions) (see Table 8 and Annex 1).

The forest has its own roads and is connected to the national highway by steeply sloping, unsurfaced roads that are subject to erosion during the monsoon.

Seven forest resources appear to have the potential to support enterprises: pine timber, pine cones, pine seeds, bamboo, wintergreen, small dimension hardwoods for the production of agriculture tools, and *majhito* (*Rubia Species*). Four have sufficient volume for exploitation but only three have a good market demand. Pine timber has great potential in terms of resource availability, market demand, available technology, investment potential and number of beneficiaries. It can also provide the community with opportunities for other economic activities. For more information on the four resources/products prioritised as potential businesses, see Annexes 5, 6, 7 and 8.

Table 7: Business prioritisation summary

Name of product	Priority
Sale of pine round logs	I
Sale of bamboo	II
Collection and sale of pine cones	III
Production of wintergreen essential oil	IV

Figure 2: Shree Hile Jaljale 'Ka' CF General Map

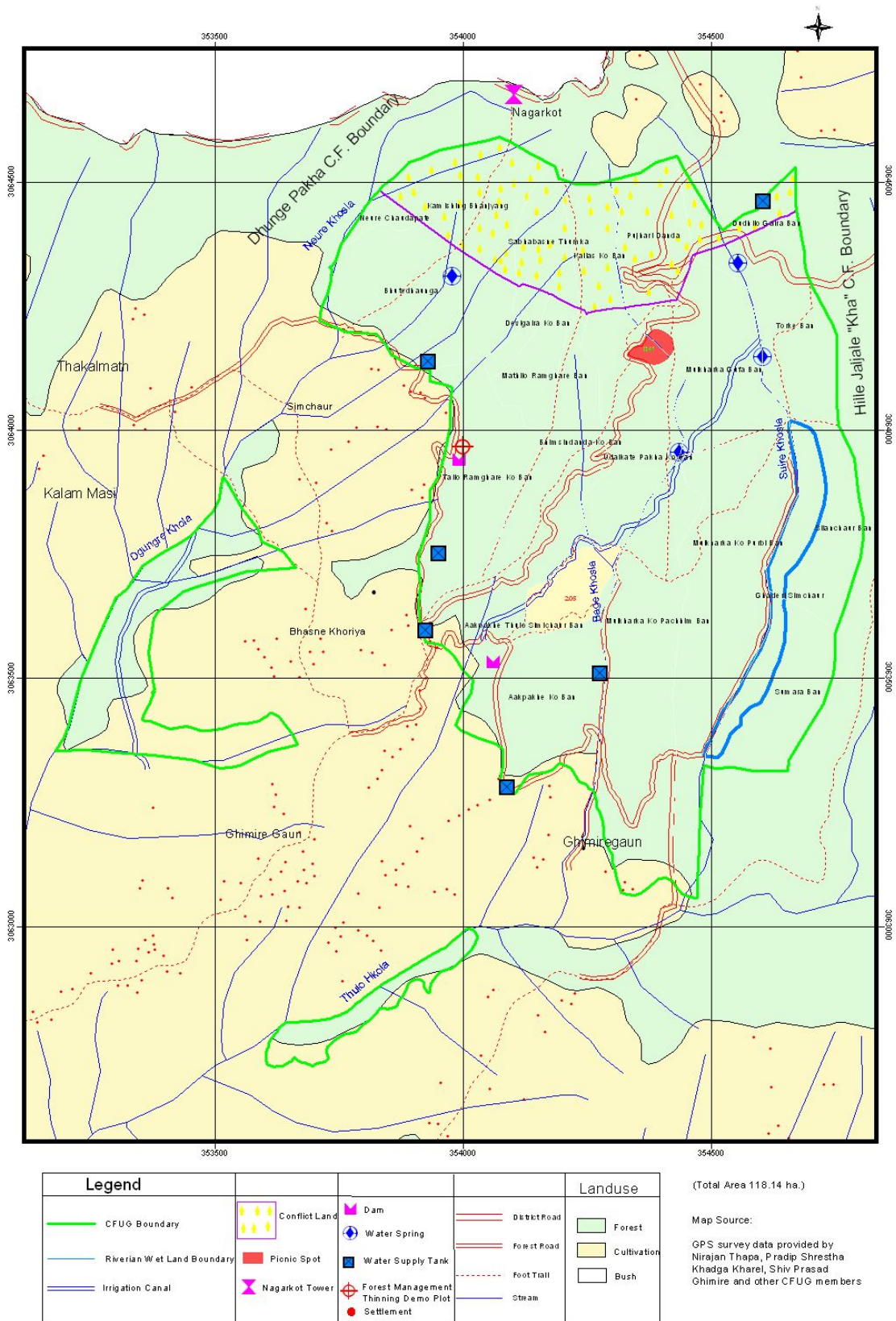


Table 8: Description of forest area

Block and sub-block names and reference IDs	Sub-block name	Area (ha)	Year of plantation	Species
Block No. 1 (Bhutedhunga ko Ban)				
1.1	Bhutedhunga	8.12	1975	<i>Pinus patula</i>
1.2	Neure Chaudapate	0.66		<i>Schima wallichii</i>
1.3	Kamising Bhanjyang	5.30	1975	<i>Pinus wallichiana</i>
Block No. 2 (Khukuri Udaune ko Ban)				
2.1	Tallo Ramghare Ban	6.91	1975	<i>Pinus patula</i>
2.2	Mathilo Ramghare Ban	2.17	1975	<i>Pinus patula</i>
2.3	Devigaira ko Ban	0.91		<i>Schima wallichii</i>
2.4	Sabhabasne Thumka	2.33	1975	<i>Pinus wallichiana</i>
Block No. 3 (Akpakhe ko Ban)				
3.1	Akpakhe ko Ban	7.33	1975	<i>Pinus patula</i>
3.2	Akpakhe Thullo Simalchaur Ban	3.82	1975	<i>Pinus patula</i>
3.3	Bhimsin Danda ko Ban	5.10	1975	<i>Pinus patula</i>
3.4	Udalkate Pakha ko Ban	6.23	1975	<i>Pinus patula</i>
3.5	Kailas ko Ban	2.46	1975	<i>Pinus wallichiana</i>
Block No. 4 (Mulkharka ko Ban)				
4.1	Mulkharka Danda ko Purbi Ban	11.96	1975	<i>Pinus patula</i>
4.2	Mulkharka Danda ko Pachhim Ban	11.37	1975	<i>Pinus patula</i>
4.3	Mulkharka Gufa Sim Ban	6.43	1975	<i>Pinus patula</i>
4.4	Pujari Danda	3.74	1971	<i>Pinus wallichiana</i>
Block No 5 (Sumara ko ban)				
5.1	Sumara Ban	5.42	1971	<i>Pinus wallichiana</i>
5.2	Silanchaur Ban	5.40	1971	<i>Pinus wallichiana</i>
5.3	Torke Ban	5.87	1971	<i>Pinus wallichiana</i>
5.4	Dudhilo Ban	1.54	1971	<i>Pinus wallichiana</i>
5.5	Ghadheri Simchaur	3.29		Wetland
Block No. 6 (Dhungre Khola)				
6.1	Ghatepati ko Ban	2.7		<i>Alnus nepalensis</i>
6.2	Birtakhet ko Ban	3.56		<i>Schima wallichii</i>
6.3	Basne Khoriya ko Ban	1.78		Landslide
6.4	Chotedanda ko Ban	1.33		Degraded barren land
Block No. 7 (Thulo khola)				
7.1	Thulo khol Ban	0.90		Landslide
7.2	Sharki khasne chhharo	1.51		<i>Schima wallichii</i>
Total		118.14		

3 Objective and Strategy

3.1 Shared Objective

The CFUG has agreed upon a shared and common objective for the management of the CF:

'Sustainable livelihood improvement through scientific management of community forest and business development with active participation of users'.

3.2 Strategy

Introduce active forest management such as thinning and pruning that will support the commercial production of high value sawlogs in order to:

- Generate funds for reinvesting in livelihood activities.
- Meet subsistence needs of the CFUG members for forest products.
- Create a suitable forest floor environment and develop much needed fodder and forage supplies.
- Improve the water regulating characteristics of the forest.

4 Spatial Organisation of the Forest

Given the multiple objectives of forest management, some spatial zoning has been introduced. Each sub-block has been allocated to a specific “working circle (WC)³” to meet the specific objectives that they are best suited for.

The whole community forest is divided into 7 WCs as shown in Table 9 and Annex 1.

Table 9: Working circles

Name of working circle	Block and sub-block number	Area (ha)	Main objective
Pine plantation	1.1, 2.1, 3.1, 3.2, 4.2	37.55	Commercial sawlog production, with grass and fodder production where possible
Conversion of pine to broad-leaf forest	1.3, 2.2, 2.4, 3.3, 3.5, 4.3, 5.1, 5.2, 5.3, 5.4	42.02	Commercial exploitation of the existing pine crop for saw logs and gradual conversion at the end of the first pine sawlog rotation to broadleaf forest for firewood, fodder and leaf litter
Protection	6.3, 6.4	3.11	Grass plantation for soil conservation
Orchard	6.2	3.56	Grafting of pears
Riverine Wetland	5.5, 7.1, 7.2	5.70	Cardamom, broom grass and <i>bojho</i> (<i>Acros calamus</i>) plantation
Ecotourism	4.4	3.74	Recreational purposes
Coppice with standard	1.2, 2.3, 3.4, 4.1, 6.1	22.46	Shrub land management

4.1 Pine Plantation Working Circle

This working circle comprises five sub-blocks distributed within four blocks: 1.1; 2.1; 3.1; 3.2; 4.2. The total area is 37.55 ha.

These areas are relatively dry, have little natural broadleaf regeneration apart from along stream edges, and are best suited for commercial pine sawlog production.

These plantations are currently seriously overstocked and so will be thinned (refer Table 11 & Table 16) out as soon as possible using the updated thinning guidelines (2006) that have been developed by NACRMLP and endorsed for this purpose by the Project Coordination Committee (PCC).

As the pine canopy is opened up through thinning operations grasses will be established on the forest floor to provide feedstuff for stall fed livestock.

³ A WC is a forest area organised with a particular objective. It is subject to one and the same silvicultural system and set of prescriptions.

4.2 Pine Conversion to Broadleaf Working Circle

This working circle comprises of 10 sub-blocks that are distributed through all five blocks: 1.3, 2.2, 2.4, 3.3, 3.5, 4.4, 5.1, 5.2, 5.3, and 5.4. This is the largest working circle with a total area of 42.02 ha.

These areas having mostly relatively northerly aspects have less exposure to the sun, suffer less moisture stress, are less subject to fire, and have more broadleaf regeneration. In some areas Pine remains dominant, whilst broadleaved species have largely taken over in others.

Here the intention is to make the best possible return on the existing pine but when it reaches commercial maturity and is cleared for sale it will be replaced with broadleaved species that are more relevant to immediate livelihood priorities. Two broad silvicultural thinning prescriptions will be applied:

- Where pine stocking remains at the recommended level for saw log production or in excess of this level it will be managed according to the updated thinning guidelines (NACRMLP 2005) (refer Table 10).
- Where pines are less well stocked in mixed forest they will be gradually removed by application of established annual allowable cut prescriptions (refer Table 11).

4.3 Protection Working Circle

This relatively small (3.11 ha) working circle consists of two sub-blocks; 6.3 which is locally referred to as Basne Khoriya ko Ban and which is a 1.78 ha landslide, and 6.4 which is locally called Chotedanda ko Ban and is 1.33 ha of degraded barren land. Both are steeply sloping erosion prone gulley sides that are being undercut by a tributary of the Dhungre Khola.

This land will be allocated to landless households. Gabion checkdams will be built to dissipate the erosive energy of this tributary and its banks will then be stabilised with bamboo at the base and improved forage and fodder species on the slopes.

4.4 Orchard Working Circle

This small working circle (3.56 ha) on the banks of the Dhungre Khola comprises one sub-block (6.2) where improved varieties of pear will be grafted to wild saplings of *Pyrus* spp. Fodder species will also be planted in this area.

4.5 Wetland Working Circle

This stream bank working circle of 5.7 ha. which comprises sub-blocks 5.5, 7.1, and 7.2 will be allocated to otherwise poor and landless families for them to manage. Here activities will focus on plantation of cardamom, broom grass and *Acros calamus* (*bojho*).

4.6 Ecotourism Working Circle

This 3.74 ha working circle comprises one sub-block 4.4, near Nagarkot. The trees will be protected, drinking water facilities and a small picnic shelter will be installed and visitors will be charged an entrance fee.

4.7 Coppice with Standard Working Circle

This 22.46 ha working circle comprises sub-blocks 1.2, 2.3, 3.4, 4.1 and 6.1 and focuses on the demands for firewood and leaf litter (bedding materials for livestock).

Activities

There will be two types of forest management activities in this WC:

- Pine tree are overstocked in sub-block 4.1, so the updated thinning guidelines (NACRMLP 2005) will be implemented as laid out in Table 10.
- In other blocks, pine and other broadleaf species will be harvested according to the annual allowable cut as given in Table 13.

5 Program Activities

All program activities are detailed below. Their budget allocations are shown in Table 16. Receipts from the sale of pine logs removed during silvicultural thinnings will finance all program activities. Income has been estimated based on forest inventory data collected during the planning process and market studies. There is, however, a wide margin of error in the inventories and log prices do vary and cannot be predicted with total confidence.

The relatively low level of confidence in income predictions has been taken into cognisance whilst planning expenditure (see Table 10). The CFUG will focus first on forest thinning to generate income and will limit spending on planned development activities to those affordable according to actual income.

Table 10: Anticipated CFUG income and expenditure and labour market creation

Year	Total income (in thousands of NRs. from log sales to external buyers only)	Total expenditure (in thousands of NRs.)	Annual profit (in thousands of NRs.)	Labour market creation (person days)
2063 (16 February, 2006 - 15 July, 2007)	1,517	1,487	30	1,016
2064 (16 July, 2007 - 15 July, 2008)	2,674	2,644	30	1,139
2065 (16 July, 2008 - 15 July, 2009)	4,333	3,473	860	1,409
2066 (16 July, 2009 - 15 July, 2010)	1,668	1,665	3	978
2067 (16 July, 2010 - 15 July, 2011)	3,953	2,691	1,262	1,179
Total	14,145	11,960	2,185	5,721

The planned forest operations will result in significant labour market development of particular benefit to the under-employed. The work will mostly be undertaken during the agricultural off-season and the associated cash income should guarantee year-round food security for all.

5.1 Activity 1: Natural Resource Management

Task 1.1 Thinning

Almost all the pine plantations are overstocked from the perspective of commercial production of saw logs and development of under-canopy forage and fodder supplies. These areas will be thinned out as rapidly as possible in order to minimise further damage.

The low thinning variety of selective thinning will be applied. Dead, dying, diseased, poorly formed and suppressed trees will be removed and evenly distributed, well- formed vigorous trees left to develop. Root and crown competition will be taken into account.

We will implement thinning prescriptions provided in ‘Thinning guidelines for *Pinus patula* and *Pinus roxburghii* plantations in Nepal’ (NACRMLP 2005) that have been specially approved by the NACRMLP PCC for this purpose in all areas except where the stocking levels of pine are very low and the intention is to convert to broad-leafed forest.

The thinning schedule is detailed in Table 11.

This activity will be the major source of funding for the CFUG. The business aspects of this operation are described under Activity 4 below.

Task 1.2 Harvesting of mixed forest according to Annual Allowable Cut Prescriptions

In the blocks where the stocking of pine plantation is less than the prescribed thinning regime, pines will be harvested according to the annual allowable cut. Similarly, blocks with broad leaf forests will be managed according to annual allowable cut to meet the demand for firewood and leaf litter as given in Table 12.

Task 1.3 Pruning

This operation will be carried out in sub-blocks 1.1, 2.1, 2.2, 2.4, 3.1, 3.2, 3.3, 3.5, 4.1, & 4.2 after training. The appropriate time for pruning is from December to March. To improve timber quality, all branches will be sawn off flush with the bole from the lower two-thirds of the tree bole. The firewood generated during pruning will be distributed to CFUG members according to the forest products sale and distribution rules and regulation mentioned in this OP.

Task 1.4 Nursery construction

Two nurseries with the capacity of producing 12,000 forest, fodder and NTFP species seedlings per year will be built in sub-blocks 3.1 and 7.1. The CFUG EC will consider whether it is more cost effective to run its own nurseries or to order planting material from a nursery a CFUG member already runs.

Task 1.5 Seedling production

Seedlings of fodder trees such as *Gogan (Saurauria nepaulensis)*, *Nimaro (Ficus nerrifolia)*, *Hatipaila (Sterospermum acerifolium)*, *Kutmero (Litsea monopetala)*, *Kimbu (Morus alba)* and *Koiralo (Bauhinia purpurea)*, and NTFP species such as *Lauth Salla (Taxus baccata)*, and *Dalchini (Cinnamom tamala)* will be produced.

Task 1.6 Seedling plantations on CF and private lands

Seedlings will be planted on CF and private lands in June and July. Seedlings produced in these nurseries will be provided free of cost to CFUG members for on farm fodder production improvement.

Table 11: Pine plantation management according to thinning regime

Year	Block and sub-block	Working circle	Area (ha)	Species	Age (years)	Stocking (no. of trees/ha)	Trees to be thinned/ha		Trees to be retained /ha	Total harvestable quantity		
							No. of trees	Vol. (cft)		No. of trees	Timber volume (cft)	Fuel wood (40% of timber in Bhari*)
2006	2.1	Pine plantation	6.91	<i>Pinus patula</i>	30	600	300	3364	300	2073	16335.24	2614
	2.2	Pine conversion to broad leaf	2.17	<i>Pinus patula</i>	90	470	170	1266.5	300	369	2748.30	440
2007	3.1	Pine plantation	7.33	<i>Pinus patula</i>	31	640	340	2647.51	300	2492	19406.24	3105
	3.2	Pine plantation	3.82	<i>Pinus patula</i>	31	366	66	475.86	300	252	1817.78	291
	3.3	Pine conversion to broad leaf	5.10	<i>Pinus patula</i>	31	525	225	1705.68	300	1148	8698.96	1392
2008	4.1	Coppice with standard	11.96	<i>Pinus patula</i>	32	400	100	943.4	300	1196	11283.06	1806
	4.2	Pine plantation	11.37	<i>Pinus patula</i>	32	640	340	2594.88	300	3869	29503.37	4720
2009	1.1	Pine plantation	8.12	<i>Pinus patula</i>	33	416	116	1137.96	300	942	9240.23	1478
2010	2.1	Pine plantation	6.91	<i>Pinus patula</i>	34	300	80	706.04	220	553	4878.73	281
	2.2	Pine conversion to broad leaf	2.17	<i>Pinus patula</i>	34	300	80	667.52	220	174	1448.52	232

* One Bhari of fire wood weighs about 40 kg

Table 12: Forest management according to annual allowable cut

Year	Block & sub block	Working circle	Area	Main species	Age	Growing stock (tree/ha)		Annul increme nt/ha	Harvestable qty. according to allowable cut/ha		Total harvestable qty. according to allowable cut			Total harvestable qty. according to allowable cut in different year		
						No	Vol (cft)		Vol (cft)	No	Vol (cft)	No	Vol (cft)	Fuel wood (head load)	No	Vol (cft)
2006	2.4	Pine conversion to broadleaf	2.33	<i>Pinus wallichiana</i>	30	134	2004.76	60.14	3	36.08	6	84	27	6	84	27
2007	3.4	Coppice with standard	6.47	<i>Pinus patula</i>	30	60	1079.56	32.10	1	9.63	7	62	21	14	124	42
				<i>Pinus wallichiana</i>	30	60	1326.52	39.51	2	17.90	13	116	26	26	232	52
	3.5	Pine conversion to broadleaf	2.46	<i>Pinus wallichiana</i>	30	67	2016.95	80.43	2	36.3	6	83	21	12	166	42
2008	4.3	Pine conversion to broadleaf	6.60	<i>Pinus patula</i>	30	60	2504.88	100.19	2	45.08	13	298	72	39	894	216
				<i>Pinus wallichiana</i>	30	120	783.2	31.04	4	23.49	26	155	20	78	465	60
	4.4	Eco-tourism	3.74	<i>Pinus wallichiana</i>	30	101	793.8	31.75	3	23.81	12	89	12	36	267	36
	1.3	Coppice with standard	5.30	<i>Pinus wallichiana</i>	30	199	5898.08	176.1	3	70.61	12	374	127	36	1122	381
2009	6.1	Coppice with standard	2.7	<i>Alnus nepalensis</i>		552	10101.72	403.6	4	302.70	14	817	112	56	3268	448
	6.2	Orchard	3.65	<i>Englehartia spicata</i>		399	3784.13	476.28	12	357.3	45	1304	178	180	712	720
2010	5.1	Pine conversion to broadleaf	5.42	<i>Pinus wallichiana</i>	35	240	8848.22	353.92	7	265.44	39	1438	195	195	7190	975
	5.2	Pine conversion to broadleaf	5.40	<i>Pinus wallichiana</i>	35	100	4618.15	184.50	4	138	22	748	102	110	3740	510

Year	Block & sub block	Working circle	Area	Main species	Age	Growing stock (tree/ha)		Annul increme nt/ha	Harvestable qty. according to allowable cut/ha		Total harvestable qty. according to allowable cut			Total harvestable qty. according to allowable cut in different year		
						No	Vol (cft)	Vol (cft)	No	Vol (cft)	No	Vol (cft)	Fuel wood (head load)	No	Vol (cft)	Fuel wood (head load)
5.3	Pine conversion to broadleaf		5.87	<i>Pinus wallichiana</i>	35	200	6403.32	256.13	6	192.09	35	1127	153	175	5635	765
5.4	Pine conversion to broadleaf		1.54	<i>Pinus wallichiana</i>	35	33	681.96	27.16	1	20.45	2	32	5	10	160	25

Task 1.7 Shrub land management

Singling and cleaning operations for shrub land management will be implemented from December to March as shown in Table 13. CFUG members are interested in converting shrub land into high forest for the production of broadleaf timber. Through shrub land management, the demand for fuel wood will be met.

Table 13: Shrubland management activity schedule

Year	Block and sub-block	Area (ha)	Silvicultural operation	Available forest product	
				Firewood from shrub land management (head load)	Leaf litter (head load)
2006	1.2	0.66	-Shrub land management	500	66
	2.2	2.17	-Shrub land management -Singling	506	326
	2.3	0.91	-Shrub land management	318	91
	4.1	11.96	-Shrub land management	2396	1797
	4.3	6.43	-Shrub land management	2640	660
	5.2	5.4	-Shrub land management	1626	810
	3.3	5.1	-Shrub land management	892	510
	3.4	6.23	-Shrub land management	1488	647
2008	3.2	3.82	-Shrub land management.	1024	543
	5.1	5.42	-Shrub land management	1805	813
2009	5.3	5.87	-Shrub land management	2788	880
	1.3	5.3	-Shrub land management	1325	795
	2.4	2.33	-Pruning -Shrub land management	1008	233
	3.5	2.46	-Shrub land management -Pruning	984	369
	4.4	3.74	-Shrub land management	1619	561
	5.4	1.54	-Shrub land management	539	231

Task 1.8 NTFP management

NTFPs available in community forest such as *lambide* (*Cinnamomum spp.*), *Taxus baccata*, lichens, gultheria, lycopodium, and *daphne* will be protected and managed. The plantation of NTFPs will be managed by the landless and by poor disadvantaged people so that they can profit by their sale. A detailed plan for developing NTFPs in CF areas follows.

1.8.1 *Nigalo* harvesting

There are some *nigalo* (*Arundinaria spp.*) bushes in sub-block 2.3 which will be managed, cleaned and harvested for bamboo basket preparation. CFUG members are interested in expanding production by separating and planting *nigalo* slips in June and July.

1.8.2 Cardamom and broom grass plantation

Sub-blocks 5.5 and 7.1 will be planted with cardamom slips in June and July. Broom grass will also be planted along forest roads in the same months.

1.8.3 Planting and managing bhojo

Bojho (*Acros calamus*) is a medicinal herb which can be grown from *rhizomes* in wetlands. The time for planting extends from April to August. The landless, poor and disadvantaged group members will be given the opportunity to generate income from the sale of *bojho* rhizomes.

1.8.4 Pear grafting on *Pyrus* species

There are some *mayal* (*Pyrus spp.*) trees in sub-block 6.2 to which pears will be grafted in February, when they shed their leaves. The landless and disadvantaged group members will be given the right to collect and sell fruits under CFUG rules and regulations.

1.8.5 *Taxus baccata* planting

T. baccata is a medicinal plant from which medicine for cancer treatment can be prepared. Cuttings will be taken from the few *Taxus* trees in the forest in order to produce seedlings in nurseries. In addition, the CFUG will also plant seedlings obtained from Dabur Nepal Nursery in June and July.

Task 1.9 Forage and Fodder Development

1.9.1 Community forage plot establishment

CFUG members depend on forest-based agriculture systems that include livestock rearing and vegetable cultivation. Out of 243 households, 224 sell milk to local milk collection centres for sale in the Kathmandu Valley. Since every winter they have to purchase in Kathmandu Valley about 500 Mt of paddy straw for NRs. two million, almost all households want to produce more of their own fodder and forage.

This CF lies in between 1500 and 2100 masl, so both sub-tropical and temperate fodder and forage species can be successfully grown. CFUG members have developed strategies for the promotion of fodder and forage development and management on both community and private farm land in close coordination with the District Livestock Service Office (DLSO), the District Soil Conservation Office (DSCO) and the DFO.

While CF areas have been planted with pine species, barren and open areas dominated by bushes and shrubs offer ample opportunities for forage development. Most landless and small landholders and disadvantaged households depend on CF for fodder and forage collection. To facilitate collection, they will be provided with CF areas in sub-blocks 2.1 (6.91 ha), 3.1 (7.33 ha), 4.1 (3 ha), 6.4 (1.33 ha) and 7.1 (.90 ha) for forage development

and management. Sub-blocks 6.4 and 7.1 will be given to the metal-working interest group and parts of sub-block 3.1 will be given to landless households. In other sub-blocks, the CFUG EC will take the lead in developing a forage use supervisor to look after management issues. Priority for forage collection will be given to poor households, which will be able to collect forage free of cost as mentioned in the forest products sale and distribution section of the OP. Improved temperate forage species recommended for northern aspects of CF sites are cocksfoot (*Dactylis glomerata*), ryegrass (*Lolium perenne*), white clover (*Trifolium repens*) and maku lotus (*Lotus pendunculatus*). In southern aspects with warmer climatic environments, sub-tropical forage species such as molasses (*Melinis minutiflora*), gamba (*Andropogon gayanus*), signal (*Brachiaria decumbens*), joint vetch (*Aeschynomene sps*) and stylo (*Stylosanthes guianensis*) can also be grown. White clover, maku lotus, joint vetch and stylo are leguminous species which also improve soil fertility and increase the protein content of animal diets. Seeds of these species will be mixed based on site quality and aspect and sown in May after the first pre-monsoonal rains have fallen.

Community forage developed under trees in about 19 ha will produce about 50 MT of dry matter per year that can reduce total paddy straw purchases about 10% and thereby produce savings of about NRs 200,000 per year.

1.9.2 Weeding and chemical fertiliser use

To promote early growth in community forage blocks, chemical fertilisers containing nitrogen and phosphorus will be applied in late August after weeding and cleaning operations.

1.9.3 Forage resource centres /home nursery establishment

For the promotion of on-farm forage development and management activities, forage resource centres will be established in all 11 sub-groups of this CFUG. They will produce vegetative materials such as slips and cuttings of selected forage species, including mott napier (*Pennisetum purpureum*), mulato (*Brachiaria brizantha*), setaria (*Setaria splendida*), forage peanut (*Arachis pinotoi*) and green leaf desmodium (*Desmodium intortum*). About 200,000 plants will be produced each year for plantation in June along terrace bunds and borders and in homesteads.

Forage peanut and green leaf desmodium are leguminous species which tolerate light tree shade. In addition, other species such as gamba, signal and stylo can also be grown on degraded farmland by seeds. CFUG members who establish forage resource centres need to be trained in forage slip and cutting production, transplantation, and forage collection techniques and practices. The CFUG EC will purchase cuttings and slips produced at the forage resource centres at the rate of NRs. 100 per 50 kg cement bag for mott, mulato, setaria and for NRs. for 50 kg of forage peanut and desmodium. These slips and cuttings will be distributed to nearby farmers to plant. About 1 million slips and cuttings of improved forage species will be grown in about 15 ha of cultivated farmlands to yield about 50 Mt of dry matter per year and reduce paddy straw purchases by 10%.

Paddy straw purchases can also be reduced by promoting agroforestry. There already are some high quality fodder trees on terrace bunds and border, but they do not suffice. The species which will be promoted include gogan (*Saurauria nepaulensis*), *Ficus neriifolia*,

hatipaila (*Sterospermum acerifolium*), *kutmero* (*Litsea monopetala*), *kimbu* (*Morus alba*) and *koiralo* (*Bauhinia purpurea*). There is still ample space for more plantations of fodder trees. The CFUG will initiate a home nursery program in which progressive women farmers of all interest groups across the *toles* will be trained in fodder seedling production and on-farm agroforestry plantation establishment and management techniques and practices. Fodder seedlings produced in these nurseries will be planted every two meters along terrace bunds. About 20,000 fodder seedlings from home and CFUG nurseries will be planted on farmland. They will be managed at 1-1.5 meters in height by lopping off fodder in order to reduce their shading of under-storey agricultural crops.

Fodder and forage programs in CF areas, roadsides, landslides and farmlands can reduce paddy straw purchases up to 35% in five years of integrated forest OP implementation.

One more practice which can reduce paddy straw purchase is to increase the feeding value of the available paddy straw, maize stalks, fodder and forage. This can be done by giving appropriate knowledge and skills to CFUG members, specifically to mix green fodder and forage with paddy straw or maize stalk by chopping these feeding materials into small pieces. This practice not only reduces wastage but also improves feeding value.

1.9.4 Forage planting along roadsides and landslides

Broom grass will be planted in June in forests and along village roadsides. Plants will not only help to stabilise roads, but also produce forage needed for livestock. The CFUG can also generate money by selling brooms made from this grass. There are some landslides within CFUG areas, such as sub-block 7.1, where fodder and forage seedlings and slips will be sown to rehabilitate the area after the DSCO carries out brushwood layering and checks dam construction.

Task 1.10 Settling land dispute with the Department of Survey

CF areas in the five sub-blocks of 1.3, 2.4, 3.5, 4.4 and 5.4 which were given to the Department of Survey have also been identified for forest management activities. There is a special provision for legal work to settle the land dispute with the Department.

5.2 Activity 2: Social Change through CFUG-Capacity Building

Task 2.1: Including women, landless and disadvantaged groups in the CFUG EC

The active and meaningful participation of women, landless and other disadvantaged groups is very important for the CF process. To ensure their voice is heard, five marginalised will be included when the CFUG EC is next reshuffled. The change should encourage their participation, especially in decision-making and should sensitise elites on the importance of inclusive practices. The existing EC will take a lead role in implementing this change.

Task 2.2: Make members aware of their constitution and OP

CFUG members will be made aware of their constitution and OP; the increased understanding should render implementation more appropriate. Two constitution and OP reflection workshops will be organised for CFUG members, including women, landless,

illiterate and other disadvantaged groups. CFUG EC members and local facilitators will lead the action. Literate CFUG members will be encouraged to read both documents.

Task 2.3: Ensure transparency in CFUG fund management

Transparency among users and concerned stakeholders is very important for strengthening governance. Public auditing will be made mandatory in the constitution. Twice a year all general members, EC members and relevant stakeholders will be invited to share and discuss the major decisions and financial management of the CFUG. A facilitator will help in the review of all documents, including the minutes of meetings, financial records, the OP and the constitution.

Task 2.4: Women's Empowerment Program

The Women's Empowerment Program is an important tool for raising awareness among and for empowering women. NACRLMP now runs eight classes, which the CFUG will take over after phase out.

Task 2.5 Scholarships for children from landless, disadvantaged and poor families

CFUG plans to support the schooling of five children from landless, disadvantaged and poor families. Scholarships are to be provided to two landless, one Kami and two very poor yet intelligent students of other interest groups. Twenty-five students will receive NRs. 2000 per year for the next five years. It is hoped that enrolment will increase and the rate of dropping out will decrease through this program.

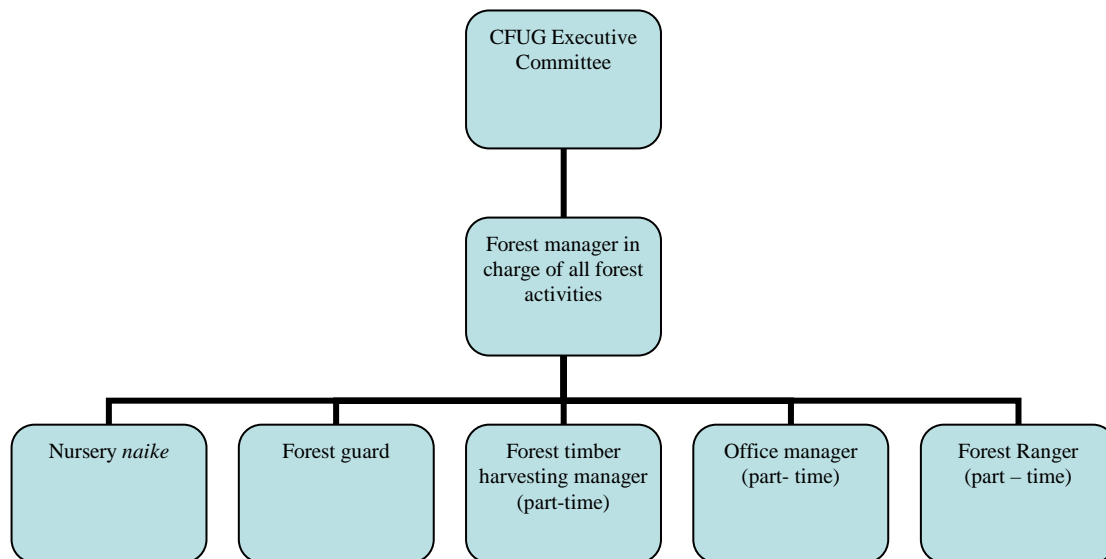
Task 2.6: Women's health program

Many women suffer from prolapsed uteruses due to the heavy workload, lack of post-natal health care, and reticence about discussing the problem. Except for three women trained in safe motherhood, all are ignorant of the cause and treatment of this problem. The three will receive additional training and two others will also be trained in close coordination with concerned stakeholders such as the District Public Health Office, ADRA Nepal and the local hospital. After training they will support the Planned Mobile Health Camps and other health awareness activities.

Task 2.7: CFUG management

One full-time forest manager will be appointed to manage all CFUG activities under the direction of the EC. S/he will be supported by a part-time office manager; a part-time forest timber harvesting manager; a full-time forest guard; and possibly a full-time nursery *naike* (see Figure 3). The part-time office manager will look after CFUG marketing and financial affairs, record keeping, and the management of the revolving fund. The forest timber harvesting manager will be recruited for six months per year to oversee all forest thinning activities.

Figure 3: Proposed CFUG staffing



Task 2.8: Part-time forest ranger support

The CFUG has recognised a need for continued technical support and has made provisions for acquiring part-time support from a qualified forest ranger.

5.3 Activity 3: Physical Infrastructure Development

Task 3.1: Water conservation pond construction

Two water conservation ponds will be constructed in forest sub-blocks 2.1 and 3.1 to irrigate vegetable plots during the winter season. This task will also make the potable water supply for downstream users more secure because upstream farmers with an adequate irrigation water supply will be not be tempted to interfere with the drinking water supply.

Task 3.2: Irrigation canal improvement

CFUG irrigation canals will be maintained to reduce leakage.

Task 3.3: Drinking water supply improvement

The drinking water reticulation system will be maintained and gradually expanded to provide individual tap stands for poor households.

Task 3.4: Construction of toilets

Toilet pans, cement and tin roofing sheets worth NRs. 2,000 will be provided to poor households with an adequate supply of water to help them improve sanitation.

Task 3.5: Community building

A multi-purpose community learning centre/guest house will be built in the grounds of the school that is being supported by the CFUG.

Task 3.6: Construction of forest roads

To facilitate the transportation of pine logs, users will construct a 3-km-long forest road starting from sub-block 3.3, skirting the borders of sub-blocks 2.1 and 2.2 and ending in sub-block 1.1. Another 2-km-long forest road will be constructed in blocks 6.1, 6.2 and 6.3. It will also act as a fire-line. Precautions will be taken during construction so that there is minimal damage to forest vegetation. The roads will benefit users considerably as easy access will bring higher prices for forest products and will promote tourism.

Task 3.7: Picnic spot development

A small picnic spot will be developed along the border between sub-blocks 3.4 and 4.3 to attract visitors.

Task 3.8: Motor road Rehabilitation

Nala-Ghimiregaon motor road will be rehabilitated to make easy access during rainy season and will be done whenever it is required.

Task 3.9: Ghatapati Construction

Ghatapati (shed) will be constructed at roadhead to carryout log sale business easier.

Task 3.10: Computer, furniture purchase

Computers and furnitures will be purchased for newly constructed community building. Training will also be provided to some persons in computer operation.

5.4 Activity 4: Income Generation

Task 4.1: Log sale business management and entrepreneurship development training

We have identified pine log sale business as having the best potential and plan to operate it under the direct management of the CFUG EC.

To ensure success, training in business management and entrepreneurship development for CFUG EC members is planned.

Log sales will generate an average of more than 3500 person days per year in employment opportunities for the community (see Table 14) and generate an average of NRs 600,000 in wages annually. It will generate an average annual net income of NRs 1.7 million to the CFUG (about NRs. 7,053 per family) for livelihood improvements. Table 14 shows the details for the next five years:

Table 14: Description of employment opportunities generated by the CFUG log sale business

Description	2006	2007	2008	2009	2010	total
No. of employment days (person days)	2,379	3,781	5,512	2,007	4,186	17,865
Value of employment (NRs)	360,917	601,377	916,650	354,680	768,091	3,001,717

Table 15: Profit and loss statement of log sale business from 2006-2010

Description	Unit	2,006	2,007	2,008	2,009	2,010
Volume of logs to be harvested	cu ft	11,533	18,478	27,211	9,524	20,518
Volume of logs after deduction of bark @ of 6%	cu ft	10,841	17,369	25,578	8,953	19,287
Average price of logs at factory gate	NRs/ cu ft	140	154	169	186	205
Income	NRs	1,517,743	2,674,875	4,332,971	1,668,220	3,953,317
Expenditures						
Variable Costs						
Cost of tree marking						
Person days required	Person days	86.50	138.59	204.08	71.43	153.89
Wage per person	NRs/day	150	158	165	174	182
Cost of tree marking	NRs	12,975	21,827	33,750	12,403	28,057
Tree felling and sectioning						
Persondays required	Person days	230.66	369.56	544.22	190.48	410.36
Wage per person	NRs/day	150	158	165	174	182
Cost of tree felling and sectioning	NRs	34,599	58,206	90,000	33,076	74,819
Tree numbering and recording						
Person days required	Person days	69.20	110.87	163.27	57.14	123.11
Wage per person	NRs/day	150	158	165	174	182
Cost of tree numbering and recording	NRs	10,380	17,462	27,000	9,923	22,446
Porters' cost for the transportation of logs (from forest to road head)						
Person days required	Person days	1,537.73	2,463.73	3,628.13	1,269.87	2,735.73
Wage per person	NRs/day	150	158	165	174	182
Porters' cost for the transportation of logs (from forest to road head)	NRs	230,660	388,038	600,003	220,504	498,795
Transportation upto market						
Vehicle cost from road head to Nala	NRs	192,217	323,365	500,002	183,754	415,663
Transportation cost from Nala to mAarket	NRs	96,108	161,683	250,001	91,877	207,831
Person days required for loading and downloading	Person days	320.36	513.28	755.86	264.56	569.94
Wages per person	NRs/day	150	158	165	174	182
Cost of loading and down loading	NRs	48,054	80,841	125,001	45,938	103,916
Total transportation cost	NRs	336,379	565,889	875,004	321,569	727,410

Description	Unit	2,006	2,007	2,008	2,009	2,010
Material consumables						
Enamel	NRs	4,450	7,130	10,499	3,675	7,917
Brush	NRs	148	238	350	122	264
Tailoring tape	NRs	148	238	350	122	264
Total material cost	NRs	4,747	7,605	11,199	3,920	8,445
Other costs						
First aid kits (medicine)	Lump sum	1,000	1,000	1,000	1,000	1,000
Stationery		1,200	1,200	1,200	1,200	1,200
Remuneration for EC members for monitoring & support	Person days	55	65	96	34	73
Rate/day	NRs/day	150	150	150	150	150
Total remuneration for EC members	NRs	8,250	9,803	14,437	5,053	10,886
Travelling	Lump sum	5,000	5,941	8,750	3,062	6,597
Kerosene		1,600	1,901	2,800	980	2,111
Total other costs		17,050	19,846	28,186	11,295	21,794
Total Variable Cost		646,789	1,078,873	1,665,142	612,690	1,381,766
Gross profit		870,954	1,596,003	2,667,828	1,055,530	2,571,551
Fixed Costs						
Managers' salary	Person months	4	6	6	6	6
Salary per month	NRs	4,000	4,200	4,410	4,631	4,862
Manager's cost	NRs	16,000	25,200	26,460	27,783	29,172
Tea & snacks	Lump sum	5,000	5,000	5,000	5,000	5,000
Depreciation		8,456	8,456	8,456	8,456	8,456
Operating profit		841,498	1,557,347	2,627,912	1,014,291	2,528,923

Task 4.2: Improved loading and unloading training

Training in improved log transportation is planned to reduce the cost of hauling logs from forest to roadside and loading them onto trucks.

Task 4.3: Improved log transportation equipment

The business plan shows that the transportation cost from forest to road head is very high (about NRs. 20 per Cft). Therefore, the CFUG plans to study some mechanical tools for easy transportation of logs and, if found feasible, to introduce these systems.

Task 4.4: Search for better marketing options

It is a well-known fact that promotion plays a vital role in business. The CFUG plans to explore different targeted markets to collect detailed information on markets and the prevailing market prices of different buyers along with their terms and conditions.

Task 4.5: Book-keeping and record-keeping training

Maintaining records and accounts is crucial for any business and helps create transparency and trust among all stakeholders. The CFUG plans to provide training to concerned persons to make records more transparent and organised.

This business will generate employment opportunities and create an environment in which the funds generated can be reinvested to promote the livelihoods of the users.

Task 4.6: Revolving fund establishment and management

Local NGO Nari Chetna and the WDO support some women's savings and credit groups to which most households belong. The groups provide credit to members at interest rates of 12-18% without collateral on a group guarantee basis. The number of beneficiaries and the scale of credit is however currently nominal.

Keeping in mind the need for credit support for income-generating activities, we plan to develop a revolving fund over three years. The revolving fund account will be a separate bank account maintained exclusively for providing credit to entrepreneurs through Savings and Credit groups. The entrepreneur will pay 12% to Savings and Credit groups out of which Savings and Credit groups will pay 6% interest with principle to the CFUG account. The women's savings and credit group will get 6% as their service charge; the other 6%, along with the principle, will be returned to the revolving fund. The fund will thus be self-sustaining and continue to meet the needs of entrepreneurs.

Tasks 4.7 and 4.8: Bamboo product promotion business

The sale of bamboo and bamboo products is the CFUG's second priority for forest-based business. It plans to conduct training and provide market exposure. Investment will come from the CFUG revolving fund if needed.

Task 4.9: Furniture marketing linkage visit

Four furniture builders will participate in a market exposure visit for the promotion of pine furniture in order to improve their skills and establish marketing linkages.

Task 4.10: Agricultural tool handle market exposure

To upgrade the business of local wooden handle producers, the CFUG plans an exposure visit to bigger markets in the hope that new linkages to buyers can be established. Entrepreneurs will be able to apply for credit from the revolving fund.

Task 4.11: Wintergreen oil market exposure visit

The CFUG plans to explore the potential for marketing wintergreen essential oil by visiting essential oil producing enterprises and HPPCL. They hope to assess the feasibility of the enterprise and attract private investors if appropriate.

Task 4.12 Bio briquette training

The CFUG will provide an opportunity to individuals interested in participating in training in making bio briquettes from *ban mara* weeds.

5.5 Activity 5: Human Resource Development

Task 5.1: Community forestry management training

Selected CFUG members from all interest groups will be trained in CF management techniques.

Task 5.2 Community forestry study tours

Participants from different sectors of the community including the landless, blacksmiths and tailors will have an opportunity to visit other CFUGs and learn from them.

Task 5.3: Vegetable farming

Most farmers sell the vegetables they grow on their farms. To promote this activity in coordination with the District Agriculture Development Office (DADO), all interest groups, but especially the landless, blacksmiths, and the poor and disadvantaged, will be trained in on and off-season vegetable farming practices, including organic manure production. Loans from the CFUG revolving fund will facilitate investment in vegetable farming.

Task 5.4: Animal health care service

The sale of milk is a main source of income for 224 households. To improve this sector, CFUG members want to establish an animal health care service centre in their village. An active, capable and motivated CFUG member will be trained as a village animal health care worker in coordination with the DLSO and a loan will be provided to buy equipment, medicines and other materials. The agro-vet will deliver services to CFUG members at reasonable rates.

Task 5.5: Women health service

The three women with some knowledge of and skills in safe motherhood will get additional training in close coordination with concern stakeholders such as the District Public Health Office, ADRA Nepal and the local hospital.

Task 5.6: Health and sanitation awareness campaign

Many CFUG members have expressed concern about health care, especially for women. The CFUG will employ female health workers to run one health camp every year. It will raise awareness, provide treatment and make referrals as appropriate.

Task 5.7: Metal-working

Nine of the 13 Kami households do metal work. They are interested in producing top quality goods which can be sold in Kathmandu Valley. The CFUG will train three active, motivated and capable persons so that they can upgrade their knowledge and skills.

Task 5.8: Training in tailoring

The CFUG will provide a training opportunity to tailors who to upgrade their skills.

Task 5.9 OP Review and revision

The OP will be reviewed every year from the fourth year with the help of local facilitators and CFUG members.

Table 16: Description, schedule and budget of all program activities

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
1	Natural resource management																
1.1	Pine plantation thinning (all operations from tree marking to factory gate)	1.1, 2.1, 2.2, 3.1, 3.2, 3.3, 4.1, and 4.2	ha	37.55		667	361	1,109	601	1,696	917	645	355	1,415	768	5,532	3,002
1.2	Harvesting of mixed forest according to Annual Allowable Cut Prescriptions	1.3, 2.4, 3.4, 3.5, 4.3, 4.4, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2	ha	51.48						10		20		20		50	
1.3	Pine plantation pruning	1.1, 2.1, 2.2, 2.4, 3.1, 3.2, 3.3, 3.5, 4.1, 4.2	ha	70.68	10 person days/ha @ NRs. 100/day	6	65	6	65	10	65	10	65	10	65	42	325
1.4	Nursery construction	3.1 and 7.1	nursery	2	NRs. 10,000/nursery	10				20		20		20		70	
1.5	Seedling production	3.1 and 7.1	seedling	12,000.00	300 person days @ NRs. 50 per day plus NRs. 7,000 for materials	11	150	25	300	25		25	300	25	300	111	1,050
1.6	Seedling plantation on CF and private lands	6.2, 6.4, 7.1 and farmlands	seedling	12,000.00	NRs. 1800 per ha @ 1500 seedlings / ha in CF only	2	18	2	18	10	36	20	36	20	36	54	144

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
1.7	Shrub land management (singling, cleaning, and coppicing)	1.2,1.3, 2.2, 2.3, 2.4, 3.2, 3.4, 3.5, 4.1, 4.3, 4.4, 5.1, 5.2, 5.3, and 5.4	ha	69.34	10 person days per ha @ NRs. 100/person day	18	194			9	92	21	212			48	498
1.8	<i>NTFP Management</i>																
1.8.1	<i>Nigalo</i> planting and harvesting	2.3	ha	Small areas	Collection free of cost												
1.8.2	Cardamom, broom grass	5.5 6.1, 7.1 and 7.2	seedling	5000	NRs. 2/seedling	5	15	6	20							11	35
1.8.3	Planting and managing <i>bojho</i> on wetlands	5.5	seedling	5000	NRs .2/seedling	9	30	20	20	20		20				69	50
1.8.4	Pear grafting to <i>Pyrus</i> trees		ha	3.56	Training cost and materials	4	10									4	10
1.8.5	<i>Taxus baccata</i> planting material from Dabur Nepal		ha	1	Planting cost only at 10,000 seedlings/ha					10		25		25		60	
1.9	Forage and Fodder Development																
1.9.1	Community forage plot establishment and management	2.1, 3.1, 4.1, 6.4 & 7.1	ha	19	land preparation 25 person days per ha, seed NRs .3000/ha, seed sowing 2 person days per ha	34	162	10	51	39	189					83	402

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
1.9.2	Weeding and chemical fertiliser use (Di-ammonium phosphate) for better establishment	2.1, 3.1, 4.1, 6.4 and 7.1	ha	19	200 kg fertiliser cost NRs. 3,500 and 5 person days to apply and covers 6 ha; some supplementary manual weeding required	4		4		4						12	
1.9.3	Forage resource centers /home nurseries	On private farms	No	11	nurseries producing a total of 200,000 slips per year	10		10		10		10		10		50	
1.9.4	Broom grass planting along roadsides	All forest and village road edges where there land is available	km	4	1000 slips/km at NRs. 2 per slip. 1 km takes 1 person day to plant	2	10	2	10	2	10	2	10	2	10	10	50
1.10	Settle land dispute with Department of Survey		legal costs			5										5	
	Sub-total					787	1,015	1,194	1,085	1,865	1,309	818	978	1,547	1,179	6,211	5,566
2	Social change through CFUG capacity building																

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
2.1	Women, landless and disadvantaged group inclusion in CFUG EC	CFUG	Persons	5				15		5		5		5		30	
2.2	Make members aware about their constitution and IOP	CFUG	CFUG general assembly meeting	2	Meeting refreshments			5		5		5		5		20	
2.3	Provide for transparency in CFUG fund management (public auditing)	CFUG	Public meeting to explain financial records every 6 months	2/year			2		2		2		2		8		
2.4	Women's Empowerment Program		Classes	8 classes with 180 members	Facilitator costs	10		20								30	
2.5	Scholarship for children from landless, disadvantaged and poor families	CFUG	No.	School-related costs for 25 children from 5 years		5		10		10		10		10		45	
2.6	Women health programs	CFUG	No.	5				10		10		10		10		40	

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days													
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)			
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour		
2.7	CFUG management (1 CFUG manager, 1 part-time finance manager, 1 full-time guard, audit and annual report preparation, TADA & office materials)	CFUG	Year					50		50		45		50		195			
2.8	Part-time technical ranger support							10		10		10		10		40			
	Sub-total							15		122		92		87		92		408	
3	Physical infrastructure development																		
3.1	Conservation pond construction	2.1 and 3.1	No.	2				250		250				300		800			
3.2	Irrigation canal improvement	CFUG	No.	1								50				50			
3.3	Drinking water improvement	CFUG	No.	2				25		50						75			
3.4	Toilet construction (subsidy)	CFUG	No	50	Supply materials at NRs. 2000 per toilet			10		50		50		50		210			
3.5	Community building construction	School compound	No	1				150		250		100				500			

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
3.6	Forest road construction and maintenance	1, 2, 3, 4 & 6	km	7		100		50		50		50		100		350	
3.7	Picnic spot development	3.4 & 4.3	No	2				40		100		50		50		240	
3.8	Motor road rehabilitation							100		300		300		300		1,000	
3.9	Pati construction									50	100					50	100
3.1	Furniture, computer purchase & training on computer									200		100		100		400	
3.11	Soil conservation (block no. 6)									300						300	
	Sub-total					535		790		1,150	100	600		900		3,975	100
	Income-generating activities																
4.1	Timber business management, entrepreneurship development training		CFUG EC	2		10										10	
4.2	Improved loading and unloading training		6 labourers			15										15	
4.3	Improved log hauling equipment					10		10								20	

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
4.4	Marketing exposure visits and interactions					10		10		10		10		10		50	
4.5	Book- and record-keeping training			2 people				8		8						16	
4.6	Revolving fund for VAHW, metal-working, vegetable farming, goat- and pig-raising, bamboo work and other income generation activities and for biogas	Landless, blacksmith and poor households	No.	50	Revolving fund	50		100		200		100				450	
4.7	Bamboo product market exposure visit			22 households				20	22							20	22
4.8	Bamboo skill development training							20	22							20	22
4.9	Furniture-marketing exposure visit			4 carpenters				20	4							20	4
4.10	Agricultural tool handle market exposure visit							10	3							10	3
4.11	Wintergreen oil market exposure visit							10								10	
4.12	Bio briquette training		persons	10		10		20		20						50	

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
	Sub-total					105		228	51	238		110		10		691	51
5	Human resource development																
5.1	Community forest management training	CFUG	Training event	5				10		10		10		10		40	
5.2	Community forestry study tour		Persons	25				50		25				50		125	
5.3	Vegetable farming training, organic manure production, and organic pesticide preparation and use training	CFUG	No.	5				10		25		15		25		75	
5.4	Village animal health care worker training	CFUG	No.	1		20	1	20								40	1
5.5	Women health worker training	CFUG	No.	3				30	3							30	3
5.6	Health and sanitation awareness campaign	CFUG	No.	5	Invite ADRA Nepal			50		5		5		5		65	
5.7	Metal-work training		Persons	3		20		40		20						80	
5.8	Training in tailoring		Persons	3				75		25						100	

No.	Activity	Sub-blocks	Unit	Qty	Basis of Cost Calculation	Yearly budget (NRs, 000) and labour requirements/person days											
						2063 (16 February 2006 - 15 July 2007)		2064 (16 July 2007 - 15 July 2008)		2065 (16 July 2008 - 15 July 2009)		2066 (16 July 2009 - 15 July 2010)		2067 (16 July 2010 - 15 July 2011)		Total budget in (000 Nrs)	
						Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour	Budget	Labour
5.9	Cost for visiting government offices					5		15		8		10		12		50	
5.1	Review OP							10		10		10		40		70	
	Sub-total					45	1	310	3	128		50		142		675	4
	Total Amount (NRs.)					1,487	1,016	2,644	1,139	3,473	1,409	1,665	978	2,691	1,179	11,960	5,721
	Estimated gross income from sales of pine logs to external buyers					1,517		2,674		4,333		1,668		3,953		14,145	

6 Forest Products Utilisation Plan

CF forest products will be distributed equitably. While managing the sale and distribution of forest products like timber and firewood that come annually, the EC will inform users in advance. If a user wants wood at some other time, s/he has to inform the EC one week in advance. Forest products are utilised in such a way that their extraction has no adverse effects. This entails taking forest conditions into consideration.

The system for forest product distribution is given in Table 17.

Table 17: Forest products sales and distribution

Forest Product	Interest group	Unit	System	Remarks
Timber	Landless	Cft.	Free	Up to 100 cft. for building house
	Poor and disadvantaged	Cft.	Free	Up to 100 cft. for building house
	Other groups	Cft.	NRs. 30.00 per cft. standing	
Dry firewood	Landless	Backload ⁴	Free	Enter forest without equipment
	Poor and disadvantaged	Backload	Free	Enter forest without equipment
	Other groups	Backload	Free	Enter forest without equipment
Green firewood	Landless	Backload	NRs. 1 for small and NRs. 2 for large branches	Obtained from silvicultural treatments
	Poor and disadvantaged	Backload	NRs. 1 for small and NRs. 2 for large branches	Obtained from silvicultural treatments
	Other groups	Backload	NRs. 3 for small and NRs. 5 for large branches	Obtained from silvicultural treatments
Forage	Landless and disadvantaged	Backload	Free	
	Other groups	Backload	To be decided	
Charcoal	Blacksmiths	Backload	Free	
Leaf litter	Landless	Backload	Free	
	Poor and disadvantaged	Backload	Free	
	Other groups	Backload	Free	

The process of forest product distribution within the CFUG

Forest products like grass, leaf litter and dry firewood will be distributed free of cost to users. Firewood produced through forest management will be distributed equitably. A bundle of firewood is NRs. 3 if the wood is branches are small and NRs 5 if they are big. Green firewood will be collected from areas easy to access during silvicultural operations.

Timber will be distributed at the rate of NRs. 30 per cft to the landless, poor and disadvantaged, and these groups will get up to 100 cft. for house building. Victims of natural calamities will receive up to 150 cft. Harvesting and thinning will be carried out

⁴ A bundle of wood one metre long and tied together with a two-metre rope

according to the number of trees specified in the OP. The EC will number the trees cut, provide bills to users and forest entrance permits in order to facilitate distribution.

The process of forest product Sales outside the CFUG

The CFUG EC will be responsible for managing the overall CFUG business (logs and NTFPs). A manager will be recruited during business season each year to assist in log sale. Focus will be given to use local manpower for business operation. The necessary skill required to operate business will be provided through training and visits. The CFUG will follow the procedures as mentioned in *Forest Act 1993* and *Forest Regulations 1995* for the sale of the logs and other forest products.

Charcoal management for poor people

Blacksmiths will be provided fuel wood and stumps freely for making charcoal.

Forest Protection

For the protection of the forest, one forest watcher will be employed for supervision. The offenders would be prosecuted according to the provisions mentioned in the fine and punishment section of the Operational Plan.

6.1 Illegal Cutting of Forest Products

The time and collection of forest products will be done according to Operational Plan. If somebody illegally collects the forest products, he or she will be prosecuted and the product would be confiscated. The fine and penalties would be levied to the offender according to the Operational Plan and the person who catches the offender or provides the information will be rewarded.

6.2 Grazing

Livestock grazing is completely prohibited in the community forest as forage and fodder plantation will be carried out in the forest according to the operational plan. If anyone is found grazing in the forest, she/he will be prosecuted according to the rules mentioned in the operational plan.

6.3 Forest Fire

Various means will be adopted to protect the forest from fire. An extension program will be carried out in the fire prone seasons (March-June). If the forest fire occurs, all the users will work together to control the fire. The forest will be opened from time to time to collect leaf litter and a fire line will be constructed.

6.4 Hunting

The hunting and trapping of wild life will be prohibited in this community forest.

6.5 Erosion Control

In this community forest none of the erosion inducing activities will be conducted. Appropriate conservation measures will be applied in the eroded areas. In the eroded site bamboo, nigalo, broom grass and grasses will be planted.

6.6 Encroachment Control

In this community forest encroachment will be strictly controlled.

6.7 Pest and Disease Control

Pests and disease would be controlled seeking technical advice from technicians immediately after the outbreak of disease. Application of pesticide and insecticide will be done according to the technical advice.

6.8 For Consideration by the Executive Committee during OP Implementation

- Executive committee will meet as mentioned in CFUG constitution.
- Directives and Circulars of the Department of Forest and DFO will be followed.
- Hammer mark will be used during timber sale.
- Transparency will be maintained for Income and expenditure. Audit report will be sent to Range Post and DFO.
- Activities will be implemented according to the interest and need of users.
- A progress report will be submitted in the general assembly and then it will be sent to the DFO.

7 Fine and Punishment

7.1 Process of Fine and Penalty

The following process will be followed:

1. Proofs and confiscated materials collection
2. Study of incident area
3. Probe with offender
4. No nepotism and favouritism in imposing fine and penalty

7.2 Delegation of Right and Responsibility for Fine and Penalty

The authority for fine and penalty lies to the user group committee. The committee could form tribunal and delegate the authority of detailed study of any incident. The committee could levy the fine and penalty on the basis of the report.

7.3 Fine and Penalty

Any group, group member and the individual out of the group, who damages the community forest, would be penalised according to his or her level of offence. The illegally collected forest products would be confiscated and fine and penalty would be levied as shown in the following table no.

Table 18: Fine and penalty

Particulars	First time	Second time	Third Time	Fourth Time	Remarks
Hamper of plants	NRs. 5	NRs. 10	NRs. 20	Expelled from the forest for 3 months	First time the individual outside the CFUG would be advised not to make mistake, if the same person commits mistake again he or she would be fined twice the penalty listed in the table.
Timber per cft	R. 100	NRs. 200	NRs. 300	"	
Forage per back load	NRs. 50	NRs. 100	NRs. 200	"	
Fodder per back load	NRs. 50	NRs. 100	NRs. 200	"	
Green fuel wood	NRs. 25	NRs. 50	NRs. 100	"	
Grazing					
a. Goat	NRs. 5	NRs. 10	NRs. 15	"	
b. Cattle	NRs. 10	NRs. 20	NRs. 30	"	
Hunting	According to current Act				
Making coal	NRs. 500	NRs. 1000	NRs. 1500	"	
Extracting tree bark	NRs. 50	NRs. 100	NRs. 150		
Cutting nigalo	NRs. 5	NRs. 10	NRs. 15		
Stealing of herbs	NRs. 50	NRs. 100	NRs. 150		
Setting fire	Charged according to current Act				
Encroachment	Let the offender plant trees as much as he has encroached and charge him NRs. 1,000 at first, NRs. 2,000 for the second encroachment and NRs. 3,000 for the third encroachment.				

7.4 Absence in Participation

In the absence of participation of any user in forest development works without reasonable cause he or she would be prohibited to use forest products for six months.

7.5 Misuse of Fund

If any committee member or user group member misuses the community forestry fund he or she would be penalised to pay back the same amount of misused fund.

7.6 Right to go to Court

If there are conflicts in the user group the committee could go to the court with the support of District Forest Office. The expense borne to go to the court would be borne by the community forestry fund.

8 Monitoring and Evaluation

This CFUG will work according to the Operational Plan for five years, and in every general assembly CFUG EC will present the annual report and financial status. Similarly, monitoring and evaluation reports of the activities related to sustainable forest management, social development, human resource development, gender and social equity and livelihood improvement will be submitted to CFUG general assembly and then to Range Post and DFO. A three member sub-committee will be formed for monitoring and evaluation and appropriate indicators will be prepared in advance. The following steps will be taken:

1. Operational plan and institutional assessment.
2. Discussion within group/committee.
3. Supervision of forestry activities.
4. Supervision of administration and financial management system.
5. Assessment of forest development process and other written documents related to forestry activities.
6. Study of CFUG annual report.

The three member committee and EC will evaluate according to the monitoring of OP. Process of self monitoring and evaluation will also be implemented.

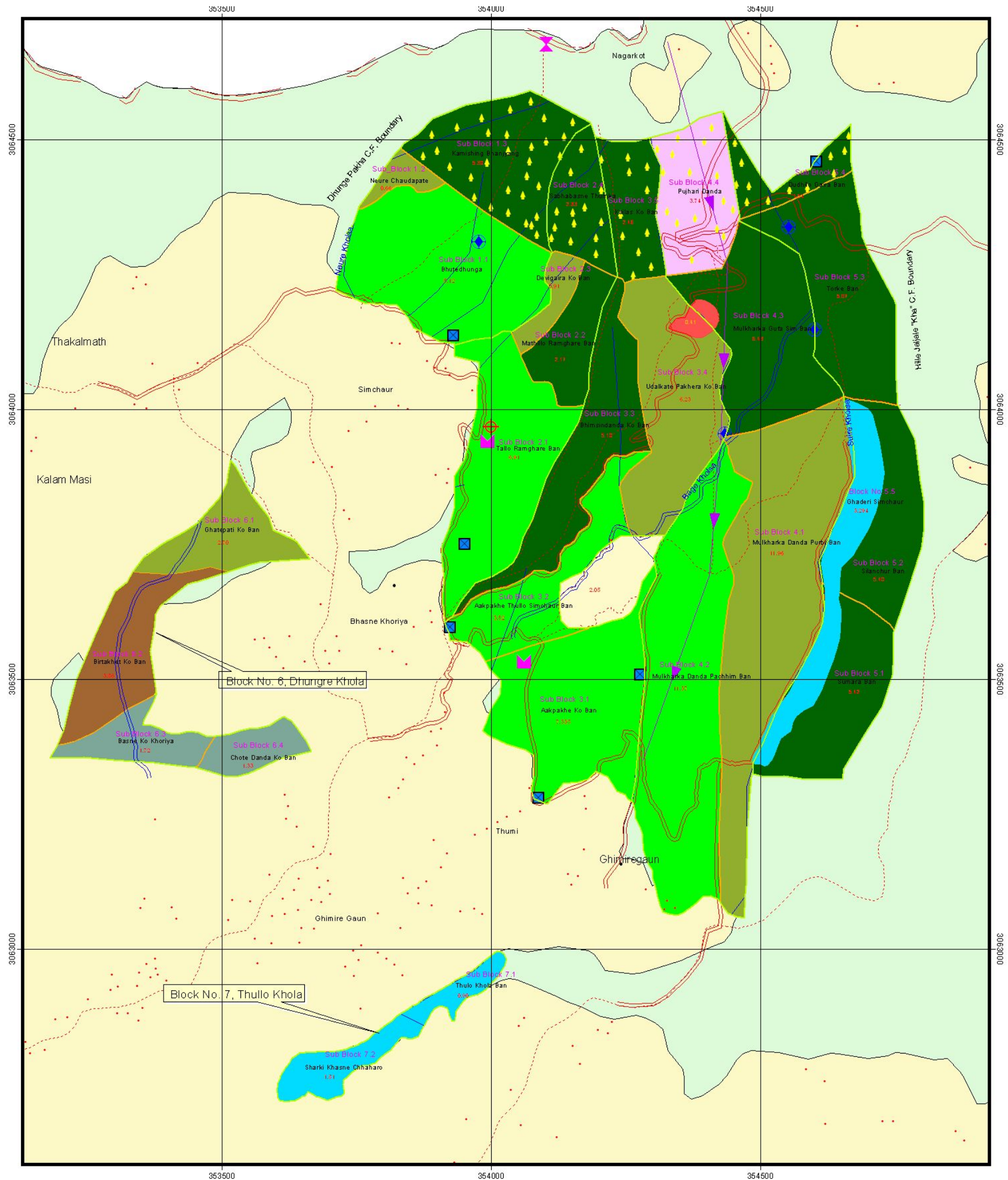
Note:

1. Monitoring and Evaluation will be conducted in a transparent manner in the presence of, and with the participation of the working group.
2. It will be helpful to modify the OP with new experiences/lesson learned.
3. An annual monitoring and evaluation format (as provided in the Community Forestry Development Guidelines) will be prepared in consultation with Range Post staff and sent to DFO.

Annex 1

CF Working Circles

Annex 1: CF Working Circles

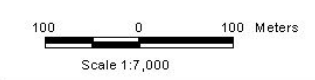


Block No.1 (Bhutedhunga Ko Ban)				Block No.2 (Kukurei Udaune Ko Ban)				Block No.3 (Akpakhe Ko Ban)				Block No.4 (Mul Kharka Ko Ban)				Block No.5 (Sumara Ko Ban)				Block No.6 (Dhungre Khotra)				Block No.7 (Thulo Khola)								
I.D. No.	Sub-Block Name	Area (ha.)	Planting Year	Species	I.D. No.	Sub-Block Name	Area (ha.)	Planting Year	Species	I.D. No.	Sub-Block Name	Area (ha.)	Planting Year	Species	I.D. No.	Sub-Block Name	Area (ha.)	Planting Year	Species	I.D. No.	Sub-Block Name	Area (ha.)	Species	I.D. No.	Sub-Block Name	Area (ha.)	Species					
1.1	Bhutedhunga	8.12	1975 A.D.	Pinus patula	2.1	Tallo Ramghare Ban	6.91	1975 A.D.	Pinus patula	3.1	Aakpakhe Ko Ban	7.33	1975 A.D.	Pinus patula	4.1	Mulkharka Danda Ko Purbi Ban	11.96	1975 A.D.	Pinus patula	5.1	Sumara Ban	5.42	1971 A.D.	Pinus wallichiana	6.1	Ghatepati Ko Ban	2.70	Alnus nepalensis	7.1	Thulo Khola Ban	0.80	Landslide
1.2	Neure Chaudapate	0.86		Schima wallichii	2.2	Mathilo Ramghare Ban	2.17	1975 A.D.	Pinus patula	3.2	Aakpakhe Thullo Simachaur Ban	3.82	1975 A.D.	Pinus patula	4.2	Mulkharka Danda Pachhim Ban	11.37	1975 A.D.	Pinus patula	5.2	Silanchaur Ban	5.40	1971 A.D.	Pinus wallichiana	6.2	Birtakhet Ko Ban	3.58	Schima wallichii	7.2	Sharki Khasne Chaharo	1.51	Schima wallichii
1.3	Kamisang Bhanjyang	5.30	1975 A.D.	Pinus wallichiana	2.3	Devigaira Ko Ban	0.91		Schima wallichii	3.3	Bhimasin Danda Ko Ban	5.10	1975 A.D.	Pinus patula	4.3	Mulkharka Gufa Sim Ban	6.43	1975 A.D.	Pinus patula	5.3	Torke Ban	5.87	1971 A.D.	Pinus wallichiana	6.3	Basne Khoriya Ko Pairo	1.78					
					2.4	Sabhabasne Thumka	2.33	1975 A.D.	Pinus wallichiana	3.4	Udakate Pakhera Ko Ban	6.23	1975 A.D.	Pinus patula	4.4	Pujari Danda	3.74	1975 A.D.	Pinus wallichiana	5.4	Dudhilo Gaira Ban	1.54	1971 A.D.	Pinus wallichiana	6.4	Chotedanda Ko Ban	1.33	Degraded Land				
										3.5	Kailas Ko Ban	2.46	1975 A.D.	Pinus wallichiana						5.5	Ghadari Simchaur	3.29		Wet Land								

Legend

Pine Plantation	Conflict Land	Dam	Block Boundary
Pine Conversion to Broadleaf	Water Spring	Water Supply Tank	Sub-Block Boundary
Coppice with Standard	Pinus Spot	Forest Management Thinning Demo Plot	District Road
Orchard	Cultivation	Settlement	Forest Road
Protection	Nagarkot Tower		Foot Trail
Riverian Wet Land			Irrigation Canal
Ecotourism			Transmission Line

Map Source:
 GPS survey data provided by Nirajan Thapa, Pradip Shrestha Khadga Kharel, Shiv Prasad Ghimire and other CFUG members



(Total Area 118.14 ha.)

Nepal - Australia
 Community Resource Management and Livelihoods Project
 January 2006

Annex 2

Resource Identification and Availability Matrix

Annex 2: Resource Identification and Availability Matrix

S.No.	Name of resource/product	Volume of products by different sources (per year)					Resource availability		Remarks
		<i>Own CFUG</i>	<i>Private land</i>	<i>Other CFUGs</i>	<i>National Forest</i>	<i>Total</i>	<i>From</i>	<i>To</i>	
1	Pine round logs	36,000 cft*	10,000 CF**	2,000 cft**	-	48,000 cft	Poush (Dec.)	Jestha (May)	*Inventory ** FGD
2	Pine cones	8 Mt **	-	4 Mt**	-	12 Mt	Magh (Jan.)	Baishak (Apr.)	** FGD
3	Bamboo	-	20,000 Pcs.**	-	-	20,000 pcs.	Kartik (Oct.)	Jestha (May)	** FGD
4	Wintergreen	6 Mt **	-	6 Mt **	-	12 Mt	Baishak (Apr.)	Jestha (May)	** FGD
5	Majhito	500 kg **	500 Kg **	-	-	1,000 kg	Mangsir (Nov.)	Baisakh (Apr.)	** FGD
6	Beed handle	1,000 pcs.**	-	-	-	1,000 pcs.	Kartik (Oct.)	Falgun (Feb.)	** FGD
7	Pine seed	200 kg** @ 500 NRs.	-	-	-	200 kg	Asoj (Sep.)	Magh (Jan.)	** FGD

Source: * Forest Inventory

** Focus group discussion

Annex 3

Market Analysis Matrix

Annex 3: Market Analysis Matrix

S.No.	Forest product	Market demand	Market location	Unit	Prevailing market price (NRs./unit)						Remarks
					Local		Road Head		Distant Market		
					Retail	Wholesale	Retail	Wholesale	Retail	Wholesale	
1	Pine round logs*	5	Local, Banepa, Panauti, Bhaktapur, Kathmandu	cft	100	90	130	120	150	140	
2	Pine cone	1	Pokhara	kg	-	3	-	-		5	
3	Bamboo	5	Local, Banepa, Pachkhal, Kathmandu	pc	50	40	60	50	100	80	
4	Wintergreen oil*	3	Kathmandu	kg	-	-	-	-	1100	872	
5	Beed handle	3	Banepa, Kathmandu	pc	-	-	-	-	20	15	
6	Pine seed	1	Kuntabesi, Kathmandu	kg	400	-	-	-	500		

Source: Focus group discussion

* Source: market interaction

Annex 4

Business Prioritisation Matrix

Annex 4: Business Prioritisation Matrix

S. No.	Name of product	Availability of raw material	Market demand	Possibility of technology	Investment probability	Physical infrastructure	BG	Economic Activities			Total	Priority
								Annual turnover	Employment opportunities	Profit level		
1	Pine round logs	5	5	5	3	3	5	5	5	5	41	I
2	Bamboo	5	5	5	5	5	5	3	3	3	39	II
3	Pine cone	5	1	1	5	3	5	1	3	1	25	III
4	Wintergreen	3	3	3	3	3	3	1	3	2	24	IV

Source: Focus group discussion

BG: Beneficiary group

Emp. Opp: Employment Opportunities

Annex 5

Business Plan for Log Sale Business, Hile Jaljale 'Ka'

Annex 5: Business Plan for Log Sale Business, Hile Jaljale 'Ka'

Analysing the business plan, CFUG will start log sale business this year and will sell the logs by delivery at the factory gate.

Background

Based on the resources available, market analysis, the availability of technology and other factors, the CFUG has prioritised four forest-based businesses: pine, bamboo, wooden handles for agricultural tools and wintergreen essential oil. The sale of pine round logs is seen as having the most potential and will be started from this fiscal year, 2062/63. The CFUG has decided to apply thinning regimes and run a log business over the next five years.

Objectives

The main objective of the log sale business is to manage the forest in a scientific manner and to generate financial capital by selling round logs. The funds generated will be re-invested in livelihood improvements for the CFUG and community. In particular, the business aims to:

- Manage the forest in a scientific manner.
- Generate about 8.6 million NRs over the next five years period from sales to external buyers.
- Provide about 18 thousand person days of employment valued at about 3 million NRs over the next five years.
- Support the equitable sharing of the generated funds by re-investing the income in livelihood improvements for CFUG members.

Description of business:

Name of entrepreneur: Hile Jaljale 'Ka' CFUG

Name of business: Pine log sale

Location of enterprise: Tukucha, Kabhre

Business operating modality: The business will be managed by the CFUG EC. A manager will be recruited during business season each year to assist in operations. Focus will be given to use local manpower for business operation. The necessary skill required to operate business will be provided through training and visits. The CFUG will follow the procedures as mentioned in forest act 1993 (2049 BS) and forest regulations 1995 (2051 BS) for the sale of the logs.

Beneficiaries: 243 households will benefit directly and the whole community will benefit through employment opportunities and reinvestment of income in the livelihoods improvement plan.

Product:

Pine round logs of different sizes (Species: *Pinus patula*, *Pinus roxburghii* and *Pinus wallichiana*).

Volume of production:

The OP lays out the volume of logs to be harvested over the five-year period as follows:

A.D	2006	2007	2008	2009	2010
B.S.	2062/63	2063/64	2064/65	2065/66	2066/67
Volume of logs (Cft)	11,533	18,478	27,211	9,524	20,518

Potential buyers:

Bira Furniture, Lalitpur

Shishar Ply Industries, Banepa

Chandra Surya Furniture, Banepa

Alternative Furniture, Bansbari

Pashupati Saw Mill, Maitighar

Other buyers in Kathmandu and Banepa

Marketing strategy:

The focus will be given to sell logs in cash. In order to avoid a glut, the CFUG will coordinate with other log selling CFUGs of near by area. Logs will be delivered to the forest road head or to factory gates depending upon the contract. Big timber buyers will be attracted by distributing tender notices widely. Rules and regulations will be followed from the tree marking to the marketing stage.

A sealed tender notice will be issued after tree marking. Judgement criteria will be developed for evaluating the bids. The key components of the market strategy follow:

- **Product** - Logs are *Pinus patula*, *inus roxburghii* and *Pinus wallichiana* species and will be sized to meet demand of the buyers. Focus will be given to sell and deliver logs within seven days of harvesting in order to maintain the quality.
- **Price** - The actual offered prices will be determined by sealed tenders. If the reserve price set is not met, the CFUG will decide to either to re-tender or negotiate a lower price with the final bidder. Last year the CFUG sold trees at the rate of 65.85 NRs. per Cft (NRs 64.73 per Cft excluding marking costs). Buyers identify the current price at between NRs 130 to 170 per Cft at the factory gate, depending upon the girth, length and quality of the logs. The CFUG will provide training to workers in improved log hauling in order to reduce hauling cost from forest to roadhead.
- **Place** - As contracted, logs will be cut and delivered to the roadside for collection by the buyer or delivered to the factory gate.
- **Promotion** - Competition among bidders will be maximised by advertising tenders and by distributing tender notice to potential buyers. The notice will also be provided to Nepal Sawmill Association, CCI, and DFOs. The nearby log selling CFUGs will also be co-ordinated to ensure that logs are offered in a timely manner and that the market is not glutted with logs. Notifications may be verbal and written.

Risks/Limitations

- The business plan is prepared on the basis of forest inventory data and may change after the tree marking process; as it clarifies the exact volume of trees that can be harvested.

- Whether or not the EC is capable of managing the business is dubious, the CFUG has planned to conduct some supporting activities.
- The need for labour to mark, record, fell and section trees can be managed by the local people. Hard jobs like transporting logs from the forest to the road head and loading and unloading them require skilful persons. The CFUG has planned to hire some skilled workers and to conduct training for its own members.
- Since twenty CFUGs in Sindhu and Kabhrepalanchowk are applying thinning regimes beginning this year, there may be a glut on the market. To avoid the likelihood of falling prices and minimal demand, the CFUG has planned to hold discussions with potential buyers and other CFUGs before thinning starts.
- The basis for the cost estimate is the past experience of CFUGs.

Production Process

The trees to be harvested will be marked and numbered by the CFUG in consultation with Range Post staff. It will then get approval from the DFO to harvest. Trees will be cut down and logs sectioned to meet the demand. After recording the number of logs of different sizes, the logs will be transported to the road head or factory gate based on the contract.

Financial Analysis Refer to Appendices 1-5 for detailed calculations

Fixed capital: NRs. 31,740

Expenditures:

Production cost per Cft: NRs 94.20 (including the cost of standing trees @ NRs 64.73/Cft)

Transportation cost per Cft (from road head to factory gate): NRs. 29.17

Sale price per Cft (proposed): NRs. 140 (after adding 13% margin)

Minimum capital required to initiate business

Description	Amount (NRs.)
Credit sale (1500 Cft)	84,405
Material and equipment	44,786
Labour cost (for 1800 Cft)	45,054
Transportation (for 1800 Cft)	53,298
Overhead	9,512.5
Total	237,055.5

Source of funding: CFUG savings

First Year

Value added by harvesting trees & converting them to logs for sawmilling & delivering them to factory gate: NRs. 148,207

Total income of CFUG: NRs. 841,498

Break-even quantity (units harvested in Year 1) 698.37 Cft⁵

⁵ This includes capital expenditure

Conclusion:

Analysing the business plan, the CFUG has decided to initiate the log selling business.

Appendix 1: Description of consumable materials/year

Material required	Quantity	Unit cost	Amount
Paint	14.84	300	4,451
Paint brush	14.83	10	148
Tailoring tape	14.83	10	148
Total			4,747

Description of equipment and depreciation

Material required	Quantity	Unit cost	Amount	Durability (years)	Annual Total Depreciation
Equipment (fixed capital)					
Bow saw 30"	6	650	3900	8	488
Bow saw 36"	4	750	3000	8	375
Blade 30"	8	195	1560	1	1560
Blade 36"	8	260	2080	2	1040
Axe	10	400	4000	4	1000
Cross-cutting saw (<i>gindua ara</i>)	6	750	4500	6	750
<i>Chhino</i>	10	350	3500	6	583
Hammer (<i>ghan</i>)	10	400	4000	5	800
<i>Khurpa</i>	8	200	1600	4	400
Rope	180	10	1800	2	900
<i>Reti</i>	30	50	1500	3	500
Measuring tape	2	150	300	5	60
Total Annual Depreciation					8,456

Appendix 2: Financial analysis of log sale business for Year 1

Income	Unit	Quantity	Rate (NRs)	Total mount
Volume of logs to be harvested	Cft	11,533		
Income from log sale (after 6% ring deduction)	Cft	10,841	140	1,517,743
Variable costs				
Tree marking	person days	86.50	150	12,975
Tree felling and sectioning	person days	230.66	150	34,599
Numbering and recording	person days	69.20	150	10,380
Portering (from forest to roadhead)	person days	1,537.73	150	230,660
Transportation				336,379
Materials				4,747
Other				17,050
Total variable costs				646,789
Fixed costs				
Manager's salary	Person months	4	4,000	16,000
Other fixed costs				5,000
Depreciation				8,456
Total fixed costs				29,456
Total cost				676,245
Gross profit				870,954
Net profit				841,498
Break even point in units harvested- (not including capital expenditure)	Cft			390.05
Break even point in units harvested- including capital expenditure	Cft			698.37

Appendix 3: Profit and loss statement of log sale business for five years

Description	Unit	2,006	2,007	2,008	2,009	2,010
Volume of logs to be harvested	cu ft	11,533	18,478	27,211	9,524	20,518
Volume of logs after deduction of bark @ of 6%	cu ft	10,841	17,369	25,578	8,953	19,287
Average price of logs at factory gate	NRs/ cu ft	140	154	169	186	205
Income	NRs	1,517,743	2,674,875	4,332,971	1,668,220	3,953,317
Expenditures						
Variable Costs						
Cost of tree marking						
Person days required	Person days	86.50	138.59	204.08	71.43	153.89
Wage per person	NRs/day	150	158	165	174	182
Cost of tree marking	NRs	12,975	21,827	33,750	12,403	28,057
Tree felling and sectioning						
Persondays required	Person days	230.66	369.56	544.22	190.48	410.36
Wage per person	NRs/day	150	158	165	174	182
Cost of tree felling and sectioning	NRs	34,599	58,206	90,000	33,076	74,819
Tree numbering and recording						
Person days required	Person days	69.20	110.87	163.27	57.14	123.11
Wage per person	NRs/day	150	158	165	174	182
Cost of tree numbering and recording	NRs	10,380	17,462	27,000	9,923	22,446
Porters' cost for the transportation of logs (from forest to road head)	Person days	1,537.73	2,463.73	3,628.13	1,269.87	2,735.73
Wage per person	NRs/day	150	158	165	174	182
Porters' cost for the transportation of logs (from forest to road head)	NRs	230,660	388,038	600,003	220,504	498,795
Transportation upto market						
Vehicle cost from road head to Nala	NRs	192,217	323,365	500,002	183,754	415,663
Transportation cost from Nala to mAarket	NRs	96,108	161,683	250,001	91,877	207,831
Person days required for loading and downloading	Person days	320.36	513.28	755.86	264.56	569.94
Wages per person	NRs/day	150	158	165	174	182
Cost of loading and down loading	NRs	48,054	80,841	125,001	45,938	103,916
Total transportation cost	NRs	336,379	565,889	875,004	321,569	727,410
Material consumables						
Enamel	NRs	4,450	7,130	10,499	3,675	7,917
Brush	NRs	148	238	350	122	264
Tailoring tape	NRs	148	238	350	122	264
Total material cost	NRs	4,747	7,605	11,199	3,920	8,445
Other costs						
First aid kits (medicine)	Lump sum	1,000	1,000	1,000	1,000	1,000

Description	Unit	2,006	2,007	2,008	2,009	2,010
Stationery		1,200	1,200	1,200	1,200	1,200
Remuneration for EC members for monitoring & support	Person days	55	65	96	34	73
Rate/day	NRs/day	150	150	150	150	150
Total remuneration for EC members	NRs	8,250	9,803	14,437	5,053	10,886
Travelling	Lump sum	5,000	5,941	8,750	3,062	6,597
Kerosene		1,600	1,901	2,800	980	2,111
Total other costs		17,050	19,846	28,186	11,295	21,794
Total Variable Cost		646,789	1,078,873	1,665,142	612,690	1,381,766
Gross profit		870,954	1,596,003	2,667,828	1,055,530	2,571,551
Fixed Costs						
Managers' salary	Person months	4	6	6	6	6
Salary per month	NRs	4,000	4,200	4,410	4,631	4,862
Manager's cost	NRs	16,000	25,200	26,460	27,783	29,172
Tea & snacks	Lump sum	5,000	5,000	5,000	5,000	5,000
Depreciation		8,456	8,456	8,456	8,456	8,456
Operating profit		841,498	1,557,347	2,627,912	1,014,291	2,528,923

Appendix 4(A): Monthly cash flow of log sale business for Year 1 (2006/2007)

Month	Jestha/ Ashad	Ashad/ Srawan	Srawan/ Bhadra	Bhadra / Aswin	Aswin/ Kartik	Kartik/ Mangsir	Mansir/ Poush	Poush /Magh	Magh/ Falgun	Falgun/ chaitra	Chaitra/ Baisakh	Baisakh/ Jestha	Jestha/ Ashad
Cash inflow	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
Cash in hand (savings of CFUG)										240,000			
Borrowing													
Income from log sales										379,436	379,436	379,436	379,436
Total cash inflow										619,436	379,436	379,436	379,436
Cash out flow													
Fixed capital (equipment)										31,740			
Tree marking and recording										3,244	3,244	3,244	3,244
Tree felling and sectioning										8,650	8,650	8,650	8,650
Numbering and recording										2,595	2,595	2,595	2,595
Portering (from forest to road head)										57,665	57,665	57,665	57,665
Transportation										84,095	84,095	84,095	84,095
Materials										4,747			
Other										4,263	4,263	4,263	4,263
Total variable costs										196,997	160,511	160,511	160,511
Fixed costs													
Manager's salary										4,000	4,000	4,000	4,000
Other fixed costs										1,250	1,250	1,250	1,250
Total fixed costs										5,250	5,250	5,250	5,250
Total costs										202,247	165,761	165,761	165,761
Cash balance										417,188	213,675	213,675	213,675
Cumulative cash balance										417,188	630,863	844,539	1,058,214

Appendix 4(B): Monthly cash flow of log sale business for Year 2 (2007/2008)

Month	Srawan	Ashad/ Srawan	Srawan/ Bhadra	Bhadra/ Aswin	Aswin/ Kartik	Kartik/ Mangsir	Mansir/ Poush	Poush /Magh	Magh/ Falgun	Falgun/ chaitra	Chaitra/ Baisakh	Baisakh/ Jestha
Cash inflow	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Cash in hand (savings of CFUG)	1,058,214											
Borrowing												
Income from log sales							267,488	534,975	534,975	534,975	534,975	267,488
Total cash inflow	1,058,214						267,488	534,975	534,975	534,975	534,975	267,488
Cash out flow												
Fixed capital (equipment)												
Tree marking and recording						10,914	10,914					
Tree felling and sectioning							11,641	11,641	11,641	11,641	11,641	
Log Numbering and recording							3,492	3,492	3,492	3,492	3,492	
Portering (from forest to road head)							77,608	77,608	77,608	77,608	77,608	
Transportation							113,178	113,178	113,178	113,178	113,178	
Materials						1,521	1,521	1,521	1,521	1,521		
Other	1,600	1,600	1,600	1,046			3,000	3,000	3,000	3,000	1,000	1,000
Total variable costs	1,600	1,600	1,600	1,046		12,435	221,353	210,440	210,440	210,440	206,919	1,000
Fixed costs												
Manager's salary							4,200	4,200	4,200	4,200	4,200	4,200
Other fixed costs	417	417	417	417	417	417	417	417	417	417	417	413
Total fixed costs	417	417	417	417	417	417	4,617	4,617	4,617	4,617	4,617	4,613
Total costs	2,017	2,017	2,017	1,463	417	12,852	225,970	215,057	215,057	215,057	211,536	5,613
Cash balance	1,056,197	-2,017	-2,017	-1,463	-417	-12,852	41,517	319,918	319,918	319,918	323,439	261,875
Cumulative cash flow	1,056,197	1,054,180	1,052,163	1,050,700	1,050,283	1,037,431	1,078,948	1,398,866	1,718,785	2,038,703	2,362,142	2,624,016

Appendix 5: Basis for cost estimation

1	The average purchasing price of pine round logs is about NRs. 140 per cft at the factory gate (Banepa)
	On average, 6% is deducted for ring (bark) (11,710 to 11,000 cft)
2	The average price of pine round logs is around 64.73 NRs per cft at the forest of Hile 'Ka' CFUG (standing)
3	On average, six persons can mark 100 trees in a day
4	On average, two persons can fell and section 100 cft of logs per day
5	On average, three persons can number and record 500 cft of logs per day
6	On average, two persons can carry 15 cft of logs in a day from forest to road head (for block 2)
7.1	It requires five person days to load and unload 180 cft of logs (from road head to Nala and Nala to factory)
7.1	Generally a truck can carry about 300 cft of round logs (from Nala to Banepa) and charges about NRs. 2500 per trip
7.3	Five tractor trips are equivalent to one truck trip. A tractor can carry about 60 cft of round logs (from Tukucha to Nala) and charges NRs. 1000 per trip
7.4	The cost of transportation by truck or tractor increases by 0.5% per year
8	Other costs average 0.63 NRs. per cft
9	Consumable materials worth of 0.41 NRs. per cft are required
10	The fixed cost is about 1.54 NRs. per cft
11	The price of pine logs is increased by 10% annually
Other supporting bases for cost calculations:	
	One litre of enamel is required to mark and number 100 trees; a tin costs about NRs. 300
	It requires 20 paint brushes to mark and number 15,550 cft; brushes cost about NRs. 10 each
	180m of rope costing about NRs. 10 per meter and lasting two years is needed)
	Two measuring tape which costs about NRs 150 per piece and lasts five years is needed
	Ten tailoring tapes costing about NRs. 10 per piece are needed; they are consumable
	20 litres of kerosene costing about 40 NRs. per litre are required (for 15,500 Cft)

Annex 6

Block and Sub-block Division and Present Status of Regeneration Pole and Tree

Annex 6: Block and Sub-block Division and Present Status of Regeneration Pole and Tree

Block & Sub-bl. no.	Boundary	Area	Aspect	Slope (°)	Height (m)	Forest type	Main species	Age (years)	Per ha stocking according to diameter class								Regeneration per ha					
									10-19 cm		20-29 cm		> than 30 cm		Total		Species	Seedlings	Saplings			
									No	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)						
1.1	E-Thaladanda ko Thado trail W-Niure Khola N-Majh Danda Niurekholsa point S-Motorable road and cultivation	8.12	Southeast	30	1900	Plantation	<i>Pinus patula</i>	30	66	11.3	167	58	183	204.7	416	274	<i>Schima wallichii</i>	333				
																			<i>Castonopsis indica</i>	166		
																				<i>Prunus cerasoides</i>	500	
																				<i>Myrica</i>	166	
																				<i>Pinus patula</i>	833	
																				<i>Miscellaneous</i>	3333	
1.2	E-Bhute Dhunga Ridge W-Majh Dandako Thado trail N-Majh Danda Niure kholsa point -Motorable road and cultivation	0.66	West	30	1900	Natural		15									<i>S.wallichiana</i>	3500	1200			
																			<i>Castonopsis indica</i>	2500	1600	
																			<i>Michaelia champaca</i>	0	1200	
																			<i>Lambade</i>	2000	800	
																			<i>Q.semicarpifolia</i>	3000	1400	
																			<i>Miscellaneous</i>	14500	2600	
1.3	E-Kamisinge Bhanjyang W-Majh Danda ko Thado trail and Bahal Ban CF N-RONAST field site office S-Pilar of Cadastral Survey Department field office	5.30	West North	28	2050	Natural and plantation	<i>Pinus wallichiana</i>	30	33	4.66	133	105	33	57.3	199	166.9	<i>Castonopsis indica</i>	2000	0			
																			<i>M.champaca</i>	333	80	
																			<i>M. esculanta</i>	0	400	
																			<i>Jhigaine</i>	333	0	
																			<i>Chille</i>	1666	933	
																			<i>Miscellaneous</i>	1000	1731	
2.1	E-Khukuri Udaune Danda trail W-Thala Danda ridge and Ramghare settlement N-Trail to Ramghare from Thala Danda settlement S-Motorable road	6.91	South	20	1900	Plantation	<i>Pinus patula</i>	30	120	20.5	280	92.2	200	168.2	600	280.9	<i>S.wallichii</i>	200	0			
																			<i>Prunus cerosides</i>	200	80	
																			<i>M. esculanta</i>	200	0	
																			<i>Jhigaine</i>	0	80	
																			<i>Chille</i>	0	160	
																			<i>Miscellaneous</i>	9600	80	
2.2	N-Khukuri Udaune ridge W-Thala Danda ridge N-Devi Gahiro stream S-Tallo Ramghare trail	2.17	South	30	2000	Natural and plantation	<i>Pinus patula</i>	30	100	17.4	167	42.3	68	82.3	335	142.0	<i>Schima wallichii</i>	333	0			
																			<i>M.esculanta</i>	333	0	
																			<i>Jhigaine</i>	667	0	

Block & Sub-bl. no.	Boundary	Area	Aspect	Slope (°)	Height (m)	Forest type	Main species	Age (years)	Per ha stocking according to diameter class								Regeneration per ha										
									10-19 cm		20-29 cm		> than 30 cm		Total		Species	Seedlings	Saplings								
									No	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)											
2.3	E-Khukuri Udaune Danda Bhimsen Danda ko trail W-Thala Danda ridge N-cadastral survey pillar S-Mathillo Ramghare Chaur trail	0.91	West South	30	2050	Natural		20										<i>Setikath</i>	5000	0							
																						<i>Schima wallichii</i>	0	800			
																							<i>Prunus cerasoides</i>	0	80		
																							Rhododendrone	0	800		
																							<i>Quercus semicarpifolia</i>	0	400		
2.4	E-Khukuri Udaune ra Bhimsen Danda trail W-Kamisinge Bhanjyang ko trail N-cadastral survey site office S-cadastral survey pillar	2.33	West South	35	2100	Natural and plantation	<i>Pinus wallichiana</i>	30	34	5.68	67	23.7	33	27.4	134	56.8		<i>Castanopsis indica</i>	666	0							
																						<i>Prunus cerasoides</i>	0	133			
																								<i>Setikath</i>	1000	1600	
																								Bakle	666	0	
																									<i>Englehartia spicata</i>	0	400
3.1	E-Bage Khola W-Sanu Khola N-forest road to Namle ridge S-forest road	7.33	West South	20	1800	Plantation	<i>Pinus patula</i>	30	100	9.2	280	95.2	220	188.2	600	292.6		<i>Schima wallichii</i>	1000								
							<i>Pinus wallichiana</i>	30						40	42.4	40	42.4					<i>Pinus patula</i>	200				
																								<i>Prunus cerasoides</i>	600		
																									<i>Myrica esculanta</i>	200	
																										Miscellaneous	3400
3.2	E-Kulachaur cultivation W-Nala Nagarkot Ghimire Gaun road N-Nagarkot Ghimire Gaun road S-Small stream	3.82	South	15	1800	Plantation and natural	<i>Pinus patula</i>	30	100	11.7	100	44.3	133	123	333	179		<i>Prunus cerasoides</i>	1000								
							<i>Pinus wallichiana</i>	30	33	18						33	18					<i>Ficus neriifolia</i>	667				
							<i>Schima wallichii</i>	33	5							33	5						Bakle	333			
							<i>Myrica esculanta</i>	34	6.6							34	6.6							Kanike	1333		
							<i>Angeri</i>	33	3.3							33	3.3							Mayal	2000		
							<i>Bakle</i>	34	1							34	1							<i>Setikath</i>	2333		
							<i>Kamire</i>	33	1.3							33	1.3										
3.3	E-Bhimsensthan trail W-Khukuri Udaune Danda ko trail N-Bhissensthan Danda S-Ghimire Gaun road	5.10	East South	25	2000	Plantation	<i>Pinus patula</i>	30	50	10.8	100	38.5	175	173	325	222.3		<i>Schima wallichii</i>	250	666							
							<i>Pinus wallichiana</i>	30	25	1.5	50	21.5	125	86.2	200	109.3					<i>M. esculanta</i>	0	200				
																								Jhigaine	1000	0	
																									<i>Setikath</i>	6000	100
																				<i>Mayal</i>	500	0					

Block & Sub-bl. no.	Boundary	Area	Aspect	Slope (°)	Height (m)	Forest type	Main species	Age (years)	Per ha stocking according to diameter class								Regeneration per ha		
									10-19 cm		20-29 cm		> than 30 cm		Total		Species	Seedlings	Saplings
									No	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)			
3.4	E-Guphasim Khola and Bage Khola W-Bhimsensthan trail N-Bhimsensthan ridge S-Irrigation channel	6.23	South	35	2000	Natural and plantation	<i>Pinus patula</i>	30	0	0	60	30.6	0	0	60	30.6	Schima wallichii	400	0
							<i>Pinus wallichiana</i>	30	20	1.8	20	11	20	24.8	60	37.6	Myrica esculanta	800	0
							<i>Schima wallichii</i>		100	10.4							PINUS wallichiana	600	0
							<i>Myrica esculanta</i>		40	2.8					40	2.8	Prunus cerasoides	200	0
							<i>Kamire</i>		100	3.6					100	3.6	Miscellaneous	10732	2240
							<i>Bakle</i>												
3.5	E-Guphasim Khola W-Bhimsendanda trail N-cadastral survey land S-Bhimsensthan ridge	2.46	South	22	2000	Natural and plantation	<i>Pinus wallichiana</i>	30	0	0	33	18.5	34	38.7	67	57.17	Schima wallichii	333	133
							<i>Schima wallichii</i>		133	17.7					133	17.66	Myrica esculanta	1333	533
							<i>Myrica esculanta</i>		67	8.39					67	8.39	Rhododendrone	1000	666
							Rhododendron		66	7.26					66	7.26	Jhigaine	666	533
																	Miscellaneous	2333	1332
4.1	E-Suire Khola and trail W-Mulakharka ridge N-Rohini Bhanjyang jtrail S-Suire Khola and Okhre Khola	11.96	East	22	2000	Plantation and natural	<i>Pinus patula</i>	30	60	38.4	40	11	60	59	160	108.4	Schima wallichii	600	0
							<i>Pinus roxburghii</i>	30	0	0	40	8.4	0	0	40	8.4	Pinus wallichiana	0	293
							<i>Pinus wallichiana</i>	30	80	4.8	20	12.6	100	109	200	126.8	Prunus cerosoides	0	160
							<i>Schima wallichii</i>		40	3.4					40	3.4	Myrica esculanta	0	240
							<i>Myrica esculanta</i>		40	2.4					40	2.4	Miscellaneous	6600	560
							<i>Jhigaine</i>		20	0.6					20	0.6			
4.2	E-Mulakharka ridge W-Bage Khola N-Rohini Bhanjyang trail S-Indra Ghimire's land and Bage Khola	11.37	West	22	2000	Plantation	<i>Pinus patula</i>	30	120	33.6	200	67.8	200	200.4	520	301.8	Pinus wallichiana	600	400
							<i>Pinus wallichiana</i>	30	60	26	0	0	40	45	100	71	Castonopsis indica	200	0
							<i>Pinus roxburghii</i>	30	20	44				20	4.4		Myrica esculanta	600	400
							<i>Schima wallichii</i>		20	1.8				20	1.8		Ficus neriifolia	200	0
																	Hingwa	200	0
																	Miscellaneous	6400	80
4.3	E-Todke Khola W-Bage Khola and Guphasim Khola N-Ghimire village and motorable road S-Indra Ghimire's cultivated land	6.43	West South	25	2050	Plantation and natural	<i>Pinus patula</i>	30	0	0	0	0	60	71	60	71	S.wallichii	1500	200
							<i>Pinus wallichiana</i>	30	40	2.6	80	19.6	0	0	120	2.22	Pinus wallichiana	0	400
							<i>Schima wallichii</i>		240	20.6					240	20.6	Myrica esculanta	1000	0
							<i>Myrica esculanta</i>		80	3.6					80	3.6	Kaulo	0	100
							Rhododendron		80	2.2					80	2.2	Hingwa	500	300
							<i>Bakle</i>		60	3.2					60	3.2	Miscellaneous	7250	3200

Block & Sub-bl. no.	Boundary	Area	Aspect	Slope (°)	Height (m)	Forest type	Main species	Age (years)	Per ha stocking according to diameter class								Regeneration per ha		
									10-19 cm		20-29 cm		> than 30 cm		Total		Species	Seedlings	Saplings
									No	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)			
4.4	E-Todke Khola W-Guphasim Khola, block 3 boundary N-cadastral survey land S-Rohoni Bhanjyang	3.74	West South	20	2100	Natural and plantation	<i>Pinus wallichiana</i>	30	34	7.2	67	15.3			101	22.5	Schima wallichii	1000	267
							<i>Pinus roxburghii</i>	30	33	5.2					33	5.2	Myrica esculanta	667	533
							<i>Michaelia champaca</i>		66	4.59					66	4.59	Angeri	33	400
							<i>Myrica esculanta</i>		100	2.66					100	2.66	Kattike	1000	267
							Rhododendron		66	3.2					66	3.2	Setikath	3333	1467
							<i>Kamire</i>		33	0.6					33	0.6	Jhigaine	667	267
5.1	E-Bhote Danda W-Suire Khola, forest trail N-Thulo Gahiro S-Batuli Gahiro	5.42	West	22	1900	Natural and plantation	<i>Pinus wallichiana</i>	35	0	0	40	21.4	200	229.4	240	250.8	S.wallichii	200	0
							<i>Schima wallichii</i>		60	9.6					60	9.6	Prunus cerosoides	0	80
							<i>Myrica esculanta</i>		80	2.6					80	2.6	Myrica esculanta	0	400
																	Michaelia champaca	0	80
																	Miscellaneous	7000	1760
5.2	-Bhote Danda, Hile « B » CFUG W-Suire Khola N-Todke Thaplo S-Thuli Gairo firing area	5.40	West-South	25	1950	Natural and plantation		35	33	2.6	0	0	67	128.3	100	130.9	Schima wallichii	1000	133
									167	24.6					167	24.6	Pinus wallichiana	667	133
									134	3.3					134	3.3	Myrica esculanta	0	267
							Rhododendron		134	5.6					134	5.6	Q.semicarpifolia	0	133
																	Miscellaneous	10332	3599
5.3	E-Todke watershed and Hile "B" CF W-Todke Khola N-cadastral survey pillar S-Todke drinking water source	5.87	West South	22	200	Natural and plantation		35	25	1	50	23	125	148.5	200	181.5	S.wallichii	250	0
							<i>Schima wallichii</i>		125	4.27					125	4.27	Pinus wallichiana	0	100
							<i>Myrica esculanta</i>		75	9.25					75	9.25	Prunus cerosoides	0	200
							Rhododendron		200	8					200	8	Hingwa	500	400
							<i>Quercus semicarpifolia</i>		50	2.25					50	2.25	Miscellaneous	3250	20100
							<i>Bakle</i>		50	1.25					50	1.25			
5.4	E - Todke thapla ko thado trail Hile kha CFUG W - Todke strem N - Cadastral survey land S -Rohini bhanjyang motor road	1.54	West South	20	250	Natural and plantation	<i>Pinus wallichiana</i>	35	0	0	33	19.3			33	19.3	Myrica esculanta	333	0
							<i>Myrica esculanta</i>		34	4.67					34	4.67	Hingwa	333	0
							Rhododendrone		135	6.34					135		Jhigaine	1000	133
							<i>Jhigaine</i>		33	2					33	2	Setikath	1000	0
							<i>Angeri</i>		163	5.34					163	5.34	Miscellaneous	0	1200

Block & Sub-bl. no.	Boundary	Area	Aspect	Slope (°)	Height (m)	Forest type	Main species	Age (years)	Per ha stocking according to diameter class								Regeneration per ha		
									10-19 cm		20-29 cm		> than 30 cm		Total		Species	Seedlings	Saplings
									No	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)	No.	Vol. (m ³)			
5.5	E - Sumar CFUG W – Forest trail N - Rohini bhanjyang jane trail S -Ghaderi ground, big stone	3.29	West South	10	1871			Wetland											
6.1	E- Dhungre Khola W-Punyawati Khola N-cultivation, Dhungre Khola S-Dhungre Khola, Punyawoti Khola point	2.70	West South	35	1500	Natural	<i>Alnus nepalensis</i>		333	36.33	33	9					Schima wallichii	1667	
							<i>Englehartia spicata</i>		0	0	0	0	133	232	133	232	Castonopsis	2333	
							Rhododendron		33	1.43					33	1.43	Jhigaine	333	
																	Michaelia champaca	1000	
																Miscellaneous	13666	666	
6.2	E-Basne Khoriya ko landslide W-Punyawati Khola N-cultivation, Dhungre Khola S-Majhuwa Khola, Punyawoti Khola point	3.56	West South	30	1400	Natural	<i>Englehartia spicata</i>		0	0	0	0	166	256	166	256	Alnus nepalensis	1000	267
							<i>S.wallichii</i>		33	3	100	33.3	0	0	133	36.33	Castonopsis	1667	0
							<i>Castonopsis</i>		0	0	67	26	33	19.33	100	45.33	Prunus cerosoides	667	133
							<i>Rhododendron</i>		0	0	33	7.66	0	0	33	7.66	Pyrus pashia (Mayal)	333	133
6.3	E-Majhuwa Khola, Dhungre Khola W-Airta cultivation N-Phadindra Mani ko cultivation S -Majuwa Khola	1.78	West South	45	1350	Natural	Landslide area												
6.4	E-Majhuwa Khola W-Ghyangpareko Khola N-Kalam masi jane trail S-Majuwa Khola	1.33	South	45	1500	Natural	Barren land												
7.1	E-Panimunde trail W-Thulo Khola N-Soto irrigation channel ko muhan, Dhunge sangu S-Dhunge sangu, Motor road	0.90	West	40	1500	Natural	Wetland along stream												
7.2	E-Cultivation W-Big khola N-Motorable road, S-Khopreng ko irrigation channel, cultivation	1.51	West	45	1450	Natural	<i>Schima wallichii</i>		100	5.16	0	0	0	0	100	5.16	S.wallichii	0	133
							<i>Alnus nepalensis</i>		0	0	0	0	133	200	133	200	Alnus nepalensis	1000	266
							<i>Michaelia champaca</i>		0	0	0	0	100	68	100	68	Michaelia champaca	333	0
							Miscellaneous		33	3.3	0	0	0	0	33	3.3	Miscellaneous	1666	666

Annex 7

CFUG Inventory Data

Annex 7: CFUG Inventory Data

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
Block 1	1.1	1	<i>Pinus patula</i>	19.8	15	0.23	1					
	1.1	2	<i>Pinus patula</i>	38.0	18	1.02	1					
	1.1	3	<i>Pinus patula</i>	44.8	19	1.50	1	2.75				
	1.1	1	<i>Pinus patula</i>	19.7	10	0.15	2					
	1.1	2	<i>Pinus patula</i>	22.6	15	0.30	2					
	1.1	3	<i>Pinus patula</i>	38.5	15	0.87	2					
	1.1	4	<i>Pinus patula</i>	33.8	15	0.67	2					
	1.1	5	<i>Pinus patula</i>	37.4	16	0.88	2					
	1.1	6	<i>Pinus patula</i>	36.0	25	1.27	2	4.15				
	1.1	1	<i>Pinus patula</i>	23.3	16	0.34	3					
	1.1	2	<i>Pinus patula</i>	22.1	20	0.38	3					
	1.1	3	<i>Pinus patula</i>	22.9	17	0.35	3					
	1.1	4	<i>Pinus patula</i>	22.2	15	0.29	3					
	1.1	5	<i>Pinus patula</i>	46.7	20	1.71	3					
	1.1	6	<i>Pinus patula</i>	34.5	20	0.93	3	4.01				
	1.1	1	<i>Pinus patula</i>	28.6	15	0.48	4					
	1.1	2	<i>Pinus patula</i>	24.0	13	0.29	4					
	1.1	3	<i>Pinus patula</i>	16.9	15	0.17	4	0.94				
	1.1	1	<i>Pinus patula</i>	25.5	12	0.31	5					
	1.1	2	<i>Pinus patula</i>	44.4	20	1.55	5					
	1.1	3	<i>Pinus patula</i>	33.5	20	0.88	5	2.73				
	1.1	1	<i>Pinus patula</i>	19.0	10	0.14	6					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	1.1	2	<i>Pinus wallichiana</i>	22.6	15	0.30	6					
	1.1	3	<i>Pinus patula</i>	25.7	18	0.47	6					
	1.1	4	<i>Pinus patula</i>	43.9	25	1.89	6	2.80	2.90	1.156	0.776	9.66
	1.2	NA										
	1.3	1	<i>Pinus wallichiana</i>	15.7	15	0.15	7					
	1.3	2	<i>Pinus wallichiana</i>	26.3	15	0.41	7					
	1.3	3	<i>Malayo</i>	12.6	10	0.06	7					
	1.3	4	<i>Myrica esculanta</i>	13.0	10	0.07	7					
	1.3	5	<i>Euria acuminata</i>	16.1	17	0.17	7					
	1.3	6	<i>Bhalayo</i>	15.1	13	0.12	7					
	1.3	7	<i>Euria acuminata</i>	11.9	12	0.07	7					
	1.3	8	<i>Pinus wallichiana</i>	30.7	22	0.81	7					
	1.3	9	<i>Pinus wallichiana</i>	30.0	22	0.78	7					
	1.3	10	<i>Pinus wallichiana</i>	38.1	20	1.14	7					
	1.3	11	<i>Pinus wallichiana</i>	42.8	24	1.73	7	5.01				
	1.3	1	<i>Rhododendron arboreum</i>	11.5	6	0.03	8					
	1.3	2	<i>Schima wallichiana</i>	17.3	10	0.12	8					
	1.3	3	<i>Musure Katus</i>	13.6	10	0.07	8					
	1.3	4	<i>Bhalayo</i>	11.0	7	0.03	8					
	1.3	1	<i>Schima wallichiana</i>	18.9	8	0.11	9					
	1.3	2	<i>Schima wallichiana</i>	22.5	15	0.30	9					
	1.3	3	<i>Euria acuminata</i>	11.9	8	0.04	9					
	1.3	4	<i>Bhalayo</i>	11.0	7	0.03	9					
	1.3	5	<i>Gobre Salla</i>	27.5	15	0.45	9	0.45	2.73	3.227	3.753	9.09
Khukuri Udaune Danda ko Ban												

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for <i>P. patula</i> , and not accounting for previous removals) m ³ /yr/ha
Block 2	2.1	1	<i>Pinus patula</i>	21.0	12	0.21	10					
	2.1	2	<i>Pinus patula</i>	22.0	15	0.28	10					
	2.1	3	<i>Pinus patula</i>	17.1	10	0.11	10					
	2.1	4	<i>Pinus patula</i>	27.9	15	0.46	10	1.07				
	2.1	1	<i>Pinus patula</i>	21.0	10	0.17	11					
	2.1	2	<i>Pinus patula</i>	17.4	12	0.14	11					
	2.1	3	<i>Pinus patula</i>	14.2	8	0.06	11					
	2.1	4	<i>Pinus patula</i>	23.3	15	0.32	11					
	2.1	5	<i>Pinus patula</i>	39.3	22	1.33	11					
	2.1	6	<i>Pinus patula</i>	38.9	21	1.25	11	3.28				
	2.1	1	<i>Pinus patula</i>	28.6	20	0.64	12					
	2.1	2	<i>Pinus patula</i>	27.0	18	0.52	12					
	2.1	3	<i>Pinus patula</i>	24.3	15	0.35	12					
	2.1	4	<i>Pinus patula</i>	24.0	13	0.29	12					
	2.1	5	<i>Pinus patula</i>	17.7	14	0.17	12					
	2.1	6	<i>Pinus patula</i>	36.7	20	1.06	12					
	2.1	7	<i>Pinus patula</i>	31.0	24	0.91	12					
	2.1	8	<i>Pinus patula</i>	39.4	20	1.22	12	5.15				
	2.1	1	<i>Pinus patula</i>	24.0	10	0.23	13					
	2.1	2	<i>Pinus patula</i>	18.0	9	0.11	13					
	2.1	3	<i>Pinus patula</i>	29.0	13	0.43	13					
	2.1	4	<i>Pinus patula</i>	28.0	14	0.43	13					
	2.1	5	<i>Pinus patula</i>	34.0	13	0.59	13					
	2.1	6	<i>Pinus patula</i>	38.0	15	0.85	13	2.64				
	2.1	1	<i>Pinus patula</i>	21.0	12	0.21	14					
	2.1	2	<i>Schima wallichiana</i>	17.0	5	0.06	14					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	2.1	3	<i>Pinus patula</i>	20.0	7	0.11	14					
	2.1	4	<i>Schima wallichiana</i>	13.0	5	0.03	14					
	2.1	5	<i>Pinus patula</i>	22.0	10	0.19	14					
	2.1	6	<i>Myrica esculanta</i>	11.5	5	0.03	14					
	2.1	7	<i>Pinus patula</i>	35.0	15	0.72	14					
	2.1	8	<i>Pinus patula</i>	36.0	13	0.66	14					
	2.1	9	<i>Pinus patula</i>	44.0	15	1.14	14	3.03	3.03	1.464	1.077	10.11
	2.2	1	<i>Pinus patula</i>	15.5	10	0.09	15					
	2.2	2	<i>Pinus patula</i>	17.8	10	0.12	15					
	2.2	3	<i>Pinus patula</i>	37.5	18	0.99	15	1.21				
	2.2	1	<i>Pinus patula</i>	38.9	25	1.48	16					
	2.2	2	<i>Pinus wallichiana</i>	26.0	18	0.48	16					
	2.2	3	<i>Pinus wallichiana</i>	18.1	18	0.23	16					
	2.2	4	<i>Pinus patula</i>	20.0	20	0.31	16					
	2.2	5	<i>Pinus patula</i>	30.0	19	0.67	16					
	2.2	6	<i>Pinus wallichiana</i>	39.0	22	1.31	16					
	2.2	7	<i>Pinus wallichiana</i>	34.1	18	0.82	16	5.31				
	Mathillo Ramghare ko Ban											
	2.2	1	<i>Pinus patula</i>	24.0	8	0.18	17					
	2.2	2	<i>Pinus patula</i>	23.5	9	0.20	17					
	2.2	3	<i>Pinus patula</i>	23.0	13	0.27	17					
	2.2	4	<i>Pinus patula</i>	24.0	12	0.27	17					
	2.2	5	<i>Pinus patula</i>	23.0	11	0.23	17					
	2.2	6	<i>Pinus patula</i>	11.0	7	0.03	17	1.18	2.57	2.378	2.258	8.56
	2.3	NA										

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for <i>P. patula</i> , and not accounting for previous removals) m ³ /yr/ha
	Khukuri Udaune Danda											
	2.4	1	<i>Schima wallichiana</i>	14.7	10	0.08	18					
	2.4	2	<i>Musure katus</i>	12.4	10	0.06	18					
	2.4	3	<i>Musure katus</i>	15.7	12	0.12	18					
	2.4	4	<i>Musure katus</i>	18.5	16	0.21	18					
	2.4	5	<i>Musure katus</i>	15.2	10	0.09	18					
	2.4	6	<i>Schima wallichiana</i>	16.1	12	0.12	18					
	2.4	7	<i>Musure katus</i>	26.2	10	0.27	18					
	2.4	8	<i>Musure katus</i>	16.2	7	0.07	18					
	2.4	9	<i>Englehartia spicata</i>	10.2	10	0.04	18					
	Sabha Basne Thumka ko Ban											
	2.4	1	<i>Schima wallichiana</i>	16.1	12	0.12	19					
	2.4	2	<i>Englehartia spicata</i>	19.1	10	0.14	19					
	2.4	3	<i>Rhododendron arboreum</i>	15.3	9	0.08	19					
	2.4	4	<i>Pinus wallichiana</i>	22.2	11	0.21	19					
	2.4	1	<i>Schima wallichiana</i>	19.2	7	0.10	20					
	2.4	2	<i>Pinus wallichiana</i>	29.3	15	0.51	20					
	2.4	3	<i>Pinus wallichiana</i>	17.5	14	0.17	20					
	2.4	4	<i>Katus</i>	16.2	7	0.07	20	0.89				
Block	Ak Pakhe ko Ban											
3	3.1	1	<i>Pinus patula</i>	16.0	15	0.15	21					
	3.1	2	<i>Pinus patula</i>	28.6	17	0.55	21					
	3.1	3	<i>Pinus patula</i>	15.8	10	0.10	21					
	3.1	4	<i>Pinus patula</i>	16.5	7	0.07	21					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	3.1	5	<i>Pinus patula</i>	36.7	18	0.95	21					
	3.1	6	<i>Pinus patula</i>	32.3	18	0.74	21					
	3.1	7	<i>Pinus patula</i>	33.5	20	0.88	21	3.44				
	3.1	1	<i>Pinus patula</i>	28.6	12	0.39	22					
	3.1	2	<i>Pinus patula</i>	24.2	10	0.23	22					
	3.1	3	<i>Pinus patula</i>	18.3	7	0.09	22					
	3.1	4	<i>Pinus patula</i>	30.3	15	0.54	22					
	3.1	5	<i>Pinus patula</i>	32.1	20	0.81	22					
	3.1	6	<i>Pinus patula</i>	45.2	24	1.92	22	3.98				
	3.1	1	<i>Pinus patula</i>	29.5	17	0.58	23					
	3.1	2	<i>Pinus patula</i>	31.6	14	0.55	23					
	3.1	3	<i>Pinus patula</i>	32.5	14	0.58	23					
	3.1	4	<i>Pinus patula</i>	26.6	19	0.53	23					
	3.1	5	<i>Pinus patula</i>	23.6	17	0.37	23	2.61				
	3.1	1	<i>Pinus patula</i>	18.0	5	0.06	24					
	3.1	2	<i>Pinus patula</i>	27.0	9	0.26	24					
	3.1	3	<i>Pinus patula</i>	22.0	10	0.19	24					
	3.1	4	<i>Pinus patula</i>	26.0	14	0.37	24					
	3.1	5	<i>Pinus patula</i>	31.0	15	0.57	24					
	3.1	6	<i>Pinus patula</i>	36.0	10	0.51	24	1.96				
	3.1	1	<i>Pinus patula</i>	25.0	9	0.22	25					
	3.1	2	<i>Pinus patula</i>	29.0	8	0.26	25					
	3.1	3	<i>Pinus patula</i>	27.0	10	0.29	25					
	3.1	4	<i>Pinus patula</i>	28.0	9	0.28	25					
	3.1	5	<i>Pinus wallichiana</i>	35.0	20	0.96	25					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	3.1	6	<i>Pinus patula</i>	33.0	33	1.41	25					
	3.1	7	<i>Pinus wallichiana</i>	39.0	18	1.07	25					
	3.1	8	<i>Pinus patula</i>	27.0	10	0.29	25	4.78	3.35	1.112	0.818	11.18
	3.2	1	<i>Pinus patula</i>	27.5	12	0.36	26					
	3.2	2	<i>Pinus patula</i>	29.0	18	0.59	26					
	3.2	3	<i>Pinus patula</i>	24.3	17	0.39	26					
	3.2	4	<i>Pinus patula</i>	17.9	10	0.13	26					
	3.2	5	<i>Pinus patula</i>	33.9	20	0.90	26	2.37				
	3.2	1	<i>Pinus patula</i>	17.2	10	0.12	27					
	3.2	2	<i>Pinus patula</i>	19.0	9	0.13	27					
	3.2	3	<i>Pinus patula</i>	35.5	25	1.24	27					
	3.2	4	<i>Pinus patula</i>	31.6	15	0.59	27					
	3.2	5	<i>Pinus patula</i>	37.3	18	0.98	27	3.05				
	3.2	1	<i>Pinus wallichiana</i>	34.5	18	0.84	28	0.84	2.09	1.132	1.075	6.96
	Bhimsensthan Danda ko Ban											
	3.3	1	<i>Pinus patula</i>	24.0	18	0.41	29					
	3.3	2	<i>Myrica esculanta</i>	12.0	4	0.02	29					
	3.3	3	<i>Schima wallichiana</i>	10.5	7	0.03	29					
	3.3	4	<i>Schima wallichiana</i>	10.5	7	0.03	29					
	3.3	5	<i>Pinus patula</i>	20.0	8	0.13	29					
	3.3	6	<i>Schima wallichiana</i>	12.0	7	0.04	29					
	3.3	7	<i>Pinus patula</i>	37.0	17	0.91	29					
	3.3	8	<i>Pinus patula</i>	32.0	20	0.80	29					
	3.3	9	<i>Pinus patula</i>	34.0	20	0.91	29					
	3.3	10	<i>Pinus patula</i>	20.0	20	0.31	29	3.47				

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	3.3	1	<i>Schima wallichiana</i>	17.7	7	0.09	30					
	3.3	2	<i>Pinus wallichiana</i>	24.0	10	0.23	30					
	3.3	3	<i>Pinus wallichiana</i>	33.0	12	0.51	30					
	3.3	4	<i>Pinus wallichiana</i>	36.0	14	0.71	30					
	3.3	5	<i>Pinus wallichiana</i>	35.0	17	0.82	30	2.27				
	3.3	1	<i>Pinus wallichiana</i>	28.8	20	0.65	31					
	3.3	2	<i>Schima wallichiana</i>	12.5	4	0.02	31					
	3.3	3	<i>Pinus wallichiana</i>	12.5	7	0.04	31					
	3.3	4	<i>Schima wallichiana</i>	14.4	8	0.07	31					
	3.3	5	<i>Pinus wallichiana</i>	30.3	21	0.76	31					
	3.3	6	<i>Pinus wallichiana</i>	30.1	19	0.68	31	2.13				
	Urgal Kate Pakhero ko Ban											
	3.4	1	<i>Schima wallichiana</i>	17.0	7	0.08	32					
	3.4	2	<i>Schima wallichiana</i>	16.0	7	0.07	32					
	3.4	3	<i>Pinus wallichiana</i>	19.0	7	0.10	32					
							32					
	3.4	1	<i>Schima wallichiana</i>	19.0	12	0.17	32					
	3.4	2	<i>Pinus wallichiana</i>	29.0	11	0.36	32	0.46				
	3.4	1	<i>Kamere</i>	13.7	6	0.04	33					
	3.4	2	<i>Myrica esculanta</i>	12.6	5	0.03	33					
	3.4	3	<i>Bakle</i>	10.7	7	0.03	33					
	3.4	4	<i>Lyonia ovalifolia</i>	10.1	4	0.02	33					
	3.4	5	<i>Schima wallichiana</i>	20.0	10	0.16	33					
	3.4	6	<i>Pinus wallichiana</i>	28.9	17	0.56	33	0.56				
	3.4	1	<i>Schima wallichiana</i>	14.4	8	0.07	34					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	3.4	2	<i>Kamere</i>	13.0	8	0.05	34					
	3.4	3	<i>Myrica esculanta</i>	20.9	7	0.12	34					
	3.4	4	<i>Myrica esculanta</i>	16.3	5	0.05	34					
	3.4	5	<i>Pinus wallichiana</i>	39.9	20	1.25	34	1.25				
	3.4	1	<i>Pinus patula</i>	24.0	17	0.38	35					
	3.4	2	<i>Pinus patula</i>	25.6	15	0.39	35					
	3.4	3	<i>Pinus patula</i>	29.9	22	0.77	35	1.54		0.517	0.491	
	Kailash ko Ban											
	3.5	1	<i>Schima wallichiana</i>	20.0	11	0.17	36					
	3.5	2	<i>Myrica esculanta</i>	19.0	9	0.13	36					
	3.5	3	<i>Pinus wallichiana</i>	28.5	17	0.54	36	0.54				
	3.5	1	<i>Schima wallichiana</i>	15.0	11	0.10	37					
	3.5	2	<i>Rhododendron arboreum</i>	11.0	6	0.03	37					
	3.5	3	<i>Schima wallichiana</i>	12.0	7	0.04	37					
	3.5	1	<i>Myrica esculanta</i>	19.2	9	0.13	38					
	3.5	2	<i>Rhododendron arboreum</i>	17.7	5	0.06	38					
	3.5	3	<i>Schima wallichiana</i>	22.3	15	0.29	38					
Block 4	Mulkharka ko Purbi Ban											
	4.1	1	<i>Myrica esculanta</i>	14.5	8	0.07	39					
	4.1	2	<i>Myrica esculanta</i>	16.0	8	0.08	39					
	4.1	3	<i>Englehartia spicata</i>	25.0	13	0.32	39					
	4.1	4	<i>Englehartia spicata</i>	15.0	12	0.11	39					
	4.1	5	<i>Myrica esculanta</i>	15.5	10	0.09	39					
	4.1	6	<i>Schima wallichiana</i>	26.0	13	0.34	39					
	4.1	7	<i>Myrica esculanta</i>	14.0	8	0.06	39					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	4.1	8	<i>Myrica esculanta</i>	11.5	7	0.04	39					
	4.1	1	<i>Schima wallichiana</i>	14.0	9	0.07	40					
	4.1	2	<i>Schima wallichiana</i>	17.0	9	0.10	40					
	4.1	3	<i>Pinus wallichiana</i>	17.6	8	0.10	40					
	4.1	4	<i>Pinus wallichiana</i>	28.0	9	0.28	40	0.37				
	4.1	1	<i>Pinus roxburghii</i>	23.7	9	0.20	41					
	4.1	2	<i>Pinus wallichiana</i>	14.5	8	0.07	41					
	4.1	3	<i>Pinus wallichiana</i>	28.4	20	0.63	41					
	4.1	4	<i>Pinus wallichiana</i>	42.2	25	1.75	41					
	4.1	5	<i>Pinus wallichiana</i>	35.3	23	1.12	41	3.77				
	4.1	1	<i>Pinus patula</i>	14.1	12	0.09	42					
	4.1	2	<i>Pinus patula</i>	29.2	12	0.40	42					
	4.1	3	<i>Pinus patula</i>	16.0	9	0.09	42					
	4.1	4	<i>Pinus wallichiana</i>	33.0	17	0.73	42					
	4.1	5	<i>Pinus patula</i>	36.2	20	1.03	42	2.34				
	4.1	1	<i>Pinus patula</i>	24.0	7	0.16	43					
	4.1	2	<i>Pinus patula</i>	18.1	10	0.13	43					
	4.1	3	<i>Pinus patula</i>	35.8	20	1.01	43					
	4.1	4	<i>Pinus patula</i>	36.3	18	0.93	43					
	4.1	5	<i>Pinus wallichiana</i>	39.6	22	1.35	43	3.58				
	4.1	1	<i>Myrica esculanta</i>	15.2	10	0.09	44					
	4.1	2	<i>Jhigainu</i>	11.7	6	0.03	44					
	4.1		<i>Jhigainu</i>	12.5	5	0.03	44					
	4.1		<i>Myrica esculanta</i>	12.5	6	0.04	44					
	4.1		<i>Pinus wallichiana</i>	32.3	18	0.74	44	0.74				

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	4.1	1	<i>Pinus roxburghii</i>	24.4	10	0.23	45					
	4.1	2	<i>Schima wallichiana</i>	19.0	6	0.09	45					
	4.1	3	<i>Pinus wallichiana</i>	14.0	8	0.06	45					
	4.1	4	<i>Pinus wallichiana</i>	14.5	8	0.07	45					
	4.1	5	<i>Pinus wallichiana</i>	14.6	8	0.07	45	0.43				
	Mulkharka ko Ban											
	4.2	1	<i>Schima wallichiana</i>	17.1	8	0.09	46					
	4.2	2	<i>Pinus patula</i>	29.5	24	0.82	46					
	4.2	3	<i>Pinus patula</i>	22.1	10	0.19	46					
	4.2	4	<i>Pinus patula</i>	33.0	25	1.07	46					
	4.2	5	<i>Pinus patula</i>	39.6	26	1.60	46	3.68				
	4.2	1	<i>Pinus wallichiana</i>	12.0	5	0.03	47					
	4.2	2	<i>Pinus wallichiana</i>	14.2	5	0.04	47					
	4.2	3	<i>Pinus wallichiana</i>	19.5	6	0.09	47					
	4.2	4	<i>Pinus patula</i>	20.3	8	0.13	47					
	4.2	5	<i>Pinus wallichiana</i>	35.5	20	0.99	47					
	4.2	6	<i>Pinus wallichiana</i>	40.3	20	1.27	47	2.55				
	4.2	1	<i>Pinus patula</i>	16.2	9	0.09	48					
	4.2	2	<i>Pinus patula</i>	18.3	12	0.16	48					
	4.2	3	<i>Pinus patula</i>	14.8	12	0.10	48					
	4.2	4	<i>Pinus patula</i>	22.9	14	0.29	48					
	4.2	5	<i>Pinus patula</i>	21.0	9	0.16	48					
	4.2	6	<i>Pinus patula</i>	24.2	15	0.34	48					
	4.2	7	<i>Pinus roxburghii</i>	19.7	15	0.23	48					
	4.2	8	<i>Pinus patula</i>	33.5	19	0.84	48					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	4.2	9	<i>Pinus patula</i>	32.4	19	0.78	48	2.99				
	4.2	1	<i>Pinus patula</i>	29.6	15	0.52	49					
	4.2	2	<i>Pinus patula</i>	24.8	12	0.29	49					
	4.2	3	<i>Pinus patula</i>	18.0	7	0.09	49					
	4.2	4	<i>Pinus patula</i>	32.1	20	0.81	49					
	4.2	5	<i>Pinus patula</i>	34.5	18	0.84	49					
	4.2	6	<i>Pinus patula</i>	33.6	18	0.80	49	3.34				
	4.2	1	<i>Pinus patula</i>	25.0	18	0.44	50					
	4.2	2	<i>Pinus patula</i>	13.6	6	0.04	50					
	4.2	3	<i>Pinus patula</i>	22.0	10	0.19	50					
	4.2	4	<i>Pinus patula</i>	23.5	7	0.15	50					
	4.2	5	<i>Pinus patula</i>	36.3	25	1.29	50					
	4.2	6	<i>Pinus patula</i>	33.5	20	0.88	50					
	4.2	7	<i>Pinus patula</i>	38.2	20	1.15	50	4.15	3.34	0.615	0.452	11.14
	Mulkharka Gufasim ko Ban											
	4.3	1	<i>Schima wallichiana</i>	14.5	9	0.07	51					
	4.3	2	<i>Schima wallichiana</i>	16.5	9	0.10	51					
	4.3	3	<i>Schima wallichiana</i>	14.0	10	0.08	51					
	4.3	4	<i>Schima wallichiana</i>	16.0	5	0.05	51					
	4.3	5	<i>Schima wallichiana</i>	14.0	5	0.04	51					
	4.3	6	<i>Schima wallichiana</i>	17.0	11	0.12	51					
	4.3	7	<i>Schima wallichiana</i>	13.0	8	0.05	51					
	4.3	8	<i>Schima wallichiana</i>	14.0	7	0.05	51					
	4.3	9	<i>Schima wallichiana</i>	15.0	8	0.07	51					
	4.3	10	<i>Schima wallichiana</i>	13.0	5	0.03	51					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for <i>P. patula</i> , and not accounting for previous removals) m ³ /yr/ha
	4.3	1	<i>Pinus wallichiana</i>	21.6	12	0.22	52					
	4.3	2	<i>Bhalayo</i>	10.5	7	0.03	52					
	4.3	3	<i>Bakle</i>	12.7	8	0.05	52					
	4.3	4	<i>Pinus wallichiana</i>	23.0	10	0.21	52	0.43				
	4.3	5										
	4.3	1	<i>Myrica esculanta</i>	23.6	4	0.09	53					
	4.3	2	<i>Pinus wallichiana</i>	17.7	3	0.04	53					
	4.3	3	<i>Lyonia ovalifolia</i>	11.6	2	0.01	53					
	4.3	4	<i>Myrica esculanta</i>	13.5	5	0.04	53					
	4.3	5	<i>Schima wallichiana</i>	10.5	3	0.01	53					
	4.3	6	<i>Myrica esculanta</i>	14.9	3	0.03	53					
	4.3	7	<i>Schima wallichiana</i>	10.5	3	0.01	53					
	4.3	8	<i>Pinus wallichiana</i>	16.7	10	0.11	53					
	4.3	9	<i>Schima wallichiana</i>	13.8	11	0.08	53	0.15				
	4.3	1	<i>Myrica esculanta</i>	17.0	5	0.06	54					
	4.3	2	<i>Pinus wallichiana</i>	21.6	10	0.18	54					
	4.3	3	<i>Rhododendron arboreum</i>	12.0	5	0.03	54					
	4.3	4	<i>Rhododendron arboreum</i>	12.4	5	0.03	54					
	4.3	5	<i>Rhododendron arboreum</i>	12.5	5	0.03	54	0.18				
	4.3	1	<i>Pinus patula</i>	27.7	17	0.51	55					
	4.3	2	<i>Pinus wallichiana</i>	29.2	18	0.60	55					
	4.3	3	<i>Schima wallichiana</i>	17.0	15	0.17	55					
	4.3	4	<i>Schima wallichiana</i>	20.9	14	0.24	55					
	4.3	5	<i>Pinus patula</i>	44.0	20	1.52	55					
	4.3	6	<i>Pinus patula</i>	31.5	20	0.78	55					
	4.3	7	<i>Pinus patula</i>	39.4	21	1.28	55	4.69				

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for <i>P. patula</i> , and not accounting for previous removals) m ³ /yr/ha
	Pujari Danda ko Ban											
	4.4	1	<i>Pinus wallichiana</i>	22.0	12	0.23	56					
	4.4	2	<i>Bakle</i>	10.5	5	0.02	56					
	4.4	3	<i>Myrica esculanta</i>	11.5	6	0.03	56					
	4.4	4	<i>Rhododendron arboreum</i>	13.0	6	0.04	56	0.23				
	4.4	1	<i>Pinus wallichiana</i>	19.3	15	0.22	57					
	4.4	2	<i>Pinus wallichiana</i>	25.2	10	0.25	57	0.47				
	4.4	1	<i>Pinus roxburghii</i>	20.0	10	0.16	58					
	4.4	2	<i>Bhalayo</i>	11.0	6	0.03	58					
	4.4	3	<i>Kamere</i>	11.0	6	0.03	58					
	4.4	4	<i>Myrica esculanta</i>	13.0	7	0.05	58					
	4.4	5	<i>Myrica esculanta</i>	10.5	6	0.03	58					
	4.4	6	<i>Euria acuminata</i>	12.3	7	0.04	58					
	4.4	7	<i>Pinus wallichiana</i>	22.1	14	0.27	58					
	4.4	8	<i>Pinus wallichiana</i>	17.2	12	0.14	58					
	4.4	9	<i>Banaru</i>	10.5	10	0.04	58					
	4.4	10	<i>Prunus ceroisides</i>	10.5	6	0.03	58					
	4.4	11	<i>Bakle</i>	10.5	5	0.02	58					
	4.4	12	<i>Chille</i>	13.6	9	0.07	58	0.56				
Block 5												
	5.1	1	<i>Schima wallichiana</i>	18.5	15	0.20	59					
	5.1	2	<i>Myrica esculanta</i>	12.8	7	0.05	59					
	5.1	3	<i>Myrica esculanta</i>	11.8	7	0.04	59					
	5.1	4	<i>Schima wallichiana</i>	17.3	15	0.18	59					
	5.1	5	<i>Schima wallichiana</i>	14.7	14	0.12	59					
	5.1	6	<i>Pinus wallichiana</i>	40.5	25	1.61	59					
	5.1	7	<i>Pinus wallichiana</i>	48.9	20	1.88	59	3.49				

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for <i>P. patula</i> , and not accounting for previous removals) m ³ /yr/ha
	5.1	1	<i>Schima wallichiana</i>	23.4	9	0.19	60					
	5.1	2	<i>Schima wallichiana</i>	28.3	18	0.57	60					
	5.1	3	<i>Myrica esculanta</i>	19.7	15	0.23	60					
	5.1	4	<i>Myrica esculanta</i>	18.9	15	0.21	60					
	5.1	1	<i>Pinus wallichiana</i>	26.1	22	0.59	61					
	5.1	2	<i>Pinus wallichiana</i>	24.0	22	0.50	61					
	5.1	3	<i>Pinus wallichiana</i>	38.1	20	1.14	61					
	5.1	4	<i>Pinus wallichiana</i>	33.9	19	0.86	61	3.08				
	5.1	1	<i>Pinus wallichiana</i>	40.5	18	1.16	62					
	5.1	2	<i>Pinus wallichiana</i>	34.5	20	0.93	62					
	5.1	3	<i>Pinus wallichiana</i>	39.0	20	1.19	62					
	5.1	4	<i>Pinus wallichiana</i>	33.0	20	0.85	62					
	5.1	5	<i>Pinus wallichiana</i>	30.4	19	0.69	62	4.83				
	5.1	1	<i>Pinus wallichiana</i>	37.9	15	0.85	63	0.85				
	Silanchotko Ban											
	5.2	1	<i>Schima wallichiana</i>	14.5	5	0.04	64					
	5.2	2	<i>Schima wallichiana</i>	18.0	10	0.13	64					
	5.2	3	<i>Schima wallichiana</i>	19.0	10	0.14	64					
	5.2	4	<i>Lyonia ovalifolia</i>	16.0	4	0.04	64					
	5.2	1	<i>Rhododendron arboreum</i>	14.9	8	0.07	65					
	5.2	2	<i>Bakle</i>	11.4	4	0.02	65					
	5.2	3	<i>Lyonia ovalifolia</i>	11.2	3	0.01	65					
	5.2	4	<i>Rhododendron arboreum</i>	10.5	5	0.02	65					
	5.2	5	<i>Rhododendron arboreum</i>	13.2	6	0.04	65					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	5.2	6	<i>Pinus wallichiana</i>	16.3	8	0.08	65					
	5.2	7	<i>Rhododendron arboreum</i>	13.7	8	0.06	65					
	5.2	8	<i>Schima wallichiana</i>	19.6	15	0.23	65					
	5.2	9	<i>Schima wallichiana</i>	19.5	15	0.22	65					
	5.2	10	<i>Pinus wallichiana</i>	12.3	15	0.09	65					
	5.2	11	<i>Pinus wallichiana</i>	18.2	15	0.20	65	0.37				
	5.2	1	<i>Bakle</i>	10.0	7	0.03	66					
	Sumara Ko Ban											
	5.3	1	<i>Rhododendron arboreum</i>	13.9	7	0.05	67					
	5.3	2	<i>Bajh</i>	16.4	7	0.07	67					
	5.3	3	<i>Myrica esculanta</i>	19.5	9	0.13	67					
	5.3	4	<i>Bajh</i>	16.8	5	0.06	67					
	5.3	5	<i>Rhododendron arboreum</i>	10.5	5	0.02	67					
	5.3	6	<i>Rhododendron arboreum</i>	12.9	5	0.03	67					
	5.3	7	<i>Rhododendron arboreum</i>	13.6	7	0.05	67					
	5.3	8	<i>Myrica esculanta</i>	18.8	10	0.14	67					
	5.3	9	<i>Rhododendron arboreum</i>	13.1	5	0.03	67					
	5.3	10	<i>Pinus wallichiana</i>	43.2	20	1.46	67	1.46				
	5.3	1	<i>Rhododendron arboreum</i>	12.1	9	0.05	68					
	5.3	2	<i>Rhododendron arboreum</i>	12.3	8	0.05	68					
	5.3	3	<i>Bakle</i>	10.2	6	0.02	68					
	5.3	4	<i>Schima wallichiana</i>	20.2	18	0.29	68					
	5.3	5	<i>Bakle</i>	12.6	6	0.04	68					
	5.3	6	<i>Rani Malayo</i>	12.3	10	0.06	68					
	5.3	7	<i>Myrica esculanta</i>	17.9	9	0.11	68					
	5.3	8	<i>Bakle</i>	11.2	7	0.03	68					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	5.3	1	<i>Rhododendron arboreum</i>	13.9	7	0.05	69					
	5.3	2	<i>Schima wallichiana</i>	28.7	10	0.32	69					
	5.3	3	<i>Schima wallichiana</i>	15.0	8	0.07	69					
	5.3	4	<i>Pinus wallichiana</i>	29.0	15	0.50	69					
	5.3	5	<i>Pinus wallichiana</i>	28.0	14	0.43	69	0.93				
	5.3	1	<i>Schima wallichiana</i>	22.1	10	0.19	70					
	5.3	2	<i>Schima wallichiana</i>	18.6	9	0.12	70					
	5.3	3	<i>Schima wallichiana</i>	14.5	7	0.06	70					
	5.3	4	<i>Schima wallichiana</i>	17.0	10	0.11	70					
	5.3	5	<i>Pinus wallichiana</i>	11.0	10	0.05	70	0.05				
	Dudhilo Gahiro ko Ban											
	5.4	1	<i>Pinus wallichiana</i>	29.5	17	0.58	71					
	5.4	2	<i>Rhododendron arboreum</i>	10.9	6	0.03	71					
	5.4	3	<i>Lyonia ovalifolia</i>	13.0	6	0.04	71					
	5.4	4	<i>Myrica esculanta</i>	21.3	8	0.14	71	0.58				
	5.4	1	<i>Euria acuminata</i>	13.0	10	0.07	72					
	5.4	2	<i>Rhododendron arboreum</i>	11.0	7	0.03	72					
	5.4	3	<i>Rhododendron arboreum</i>	16.2	7	0.07	72					
	5.4	4	<i>Chille</i>	11.2	10	0.05	72					
	5.4	5	<i>Rhododendron arboreum</i>	13.5	10	0.07	72					
	5.4	6	<i>Lyonia ovalifolia</i>	16.3	7	0.07	72					
	5.4	7	<i>Lyonia ovalifolia</i>	10.2	4	0.02	72					
	5.4	8	<i>Kanike</i>	11.0	6	0.03	72					
Block 6	Dhunge Khola ko Ban											
	6.1	1	<i>Uttis</i>	10.1	7	0.03	73					
	6.1	2	<i>Uttis</i>	11.1	10	0.05	73					
	6.1	3	<i>Uttis</i>	11.0	11	0.05	73					

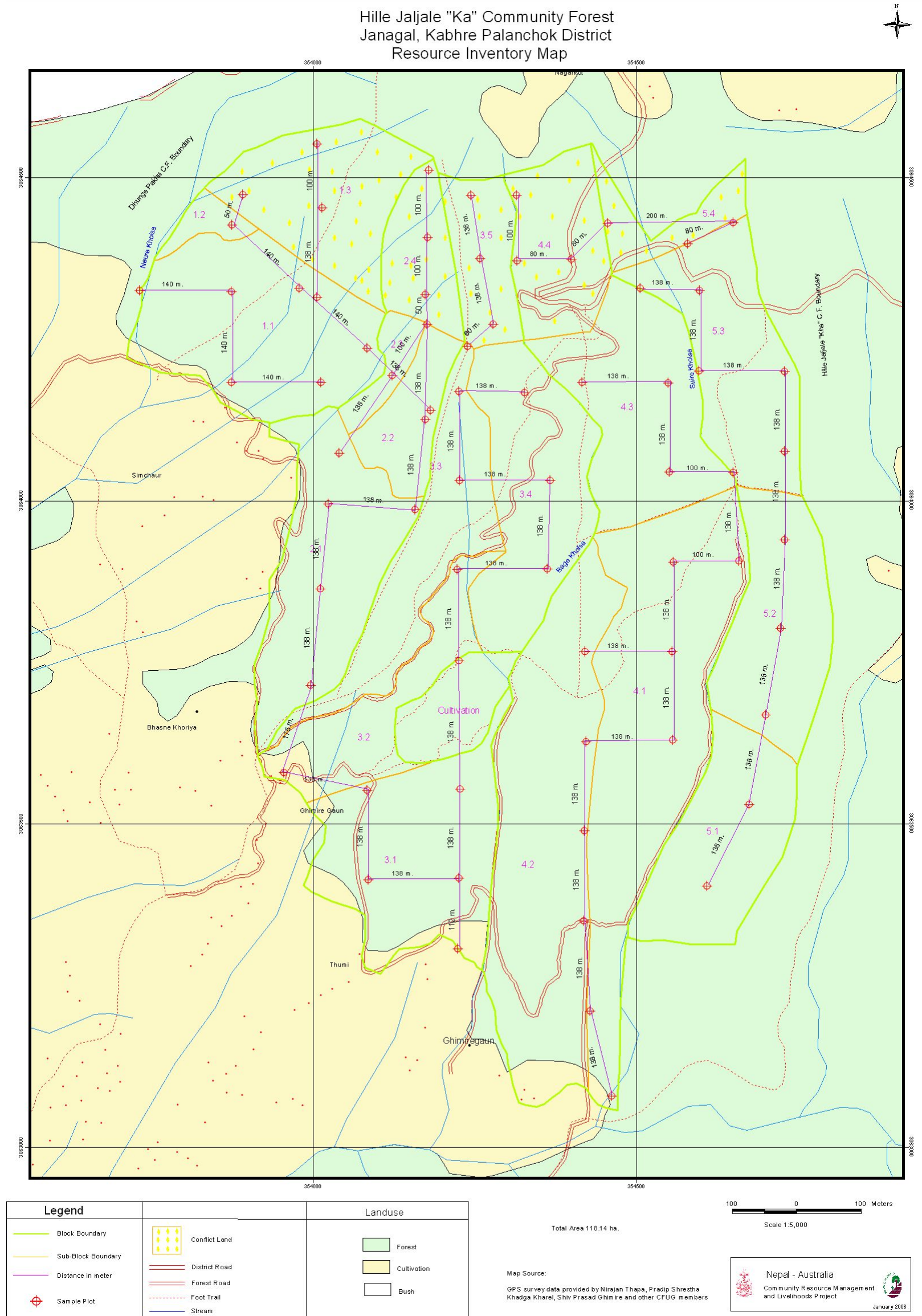
Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for P patula, and not accounting for previous removals) m ³ /yr/ha
	6.1	4	<i>Uttis</i>	20.0	15	0.24	73					
	6.1	5	<i>Uttis</i>	12.0	16	0.09	73					
	6.1	6	<i>Uttis</i>	11.0	10	0.05	73					
	6.1	7	<i>Uttis</i>	26.3	10	0.27	73					
	6.1	1	<i>Rhododendron arboreum</i>	24.5	10	0.24	74					
	6.1	2	<i>Englehartia spicata</i>	37.7	12	0.67	74					
	6.1	3	<i>Englehartia spicata</i>	51.5	17	1.77	74					
	6.1	4	<i>Englehartia spicata</i>	66.0	19	3.25	74					
	6.1	5	<i>Englehartia spicata</i>	40.5	20	1.29	74					
	6.1	1	<i>Uttis</i>	17.4	12	0.14	75					
	6.1	2	<i>Englehartia spicata</i>	10.5	13	0.06	75					
	6.1	3	<i>Rhododendron arboreum</i>	20.0	16	0.25	75					
	Birta Khet Ban											
	6.2	1	<i>Rhododendron arboreum</i>	24.5	10	0.24	76					
	6.2	2	<i>Englehartia spicata</i>	36.7	12	0.63	76					
	6.2	3	<i>Englehartia spicata</i>	51.5	17	1.77	76					
	6.2	4	<i>Englehartia spicata</i>	66.0	19	3.25	76					
	6.2	5	<i>Englehartia spicata</i>	36.5	15	0.78	76					
	6.2	6	<i>Englehartia spicata</i>	40.5	20	1.29	76					
	6.2	1	<i>Katus</i>	29.8	12	0.42	77					
	6.2	2	<i>Schima wallichiana</i>	27.8	10	0.30	77					
	6.2	3	<i>Katus</i>	29.5	11	0.38	77					
	6.2	4	<i>Schima wallichiana</i>	28.2	13	0.41	77					
	6.2	1	<i>Schima wallichiana</i>	26.1	10	0.27	78					

Block	Sub-block	S.No.	Species	DBH (cm)	Height (m)	Volume (m ³)	No. of plots	Plot volume of pine (m ³)	Average plot volume of pine (m ³)	Standard deviation (of selected sub-blocks)	90% confidence limits (of selected sub-blocks) +/-	Estimated MAI of selected sub-plots (assuming age 30 yrs for <i>P. patula</i> , and not accounting for previous removals) m ³ /yr/ha
	6.2	2	<i>Schima wallichiana</i>	14.7	11	0.09	78					
	6.2	3	<i>Uttis</i>	30.5	17	0.62	78					
	6.2	4	<i>Katus</i>	38.5	10	0.58	78					
Block 7	7.1	NA										
	7.2	1	<i>Schima wallichiana</i>	10.5	13	0.06	79					
	7.2	2	<i>Schima wallichiana</i>	12.5	15	0.09	79					
	7.2	3	<i>Schima wallichiana</i>	18.1	12	0.15	79					
	7.2	4	<i>Bakle</i>	20.3	10	0.16	79					
	7.2	1	<i>Uttis</i>	50.1	20	1.97	80					
	7.2	2	<i>Uttis</i>	41.1	21	1.39	80					
	7.2	3	<i>Uttis</i>	42.2	18	1.26	80					
	7.2	4	<i>Englehartia spicata</i>	51.1	20	2.05	80					
	7.2	1	<i>Uttis</i>	49.0	15	1.41	81					

Annex 8

Resource Inventory Map Showing Sample Plots

Annex 8: Resource Inventory Map Showing Sample Plots



Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of AusAID and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated November 2002.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared in February 2006 and is based on the conditions encountered and information received at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.