

Norbuling Community Forest Management Plan Trashiding Geog, Dagana

Plan Period-2023-2033



(1st Revision)

APPROVAL SHEET

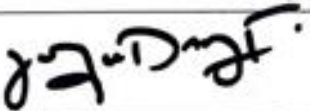
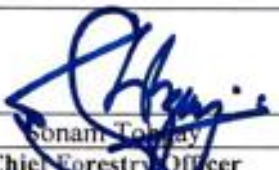
Name of Community Forest	Norbuling
Village	Loduma
Chiwog	Norbuling
Gewog	Trashiding
Dzongkhag	Dagana
Production area (Hectare/Acre)	38.61 (95.37 acre)
Protection area (Hectare/Acre)	9.83 (24.28acre)
Total Community Forest Area (Hectare/Acre)	48.44 (119.65 acre)
Total CFMG Member (No. of HH)	21

Prepared and Submitted for Approval

	Community Forest Management Group	Forestry Representative (CFMP facilitator)	Gewog Administration	Social Forestry Section	Divisional/Park Office
Signature					
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Title	Chairperson	Forest Ranger-I	Gup	Sr. Forest Ranger	Chief Forestry Officer

REVIEWED AND RECOMMENDED FOR APPROVAL

REVIEWED and RECOMMENDED FOR APPROVAL

Signature		
Name	Tse Haim Dorje	Sonam Tobgay
Title	Focal Officer	Chief Forestry Officer
Division	Forest Resources Planning and Implementation Section	Forest Resources Planning and Management Division

APPROVED BY:



DIRECTOR

Department of Forest and Park Services

Approval No. DoFPS/FRPMD/FRPIS/CF 2-2/2022-2023/846 Dated 28th March 2023

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Acronym

CF	Community Forest
CFMG	Community Forest Management Group
CFMP	Community Forest Management Plan
HH	Household
SFED	Social Forestry and Extension Division
SFES	Social Forestry and Extension Section
WWF	Worldwide Fund for Nature
Ha	Hectare
CFO	Chief Forestry Officer
AHL	Annual Harvesting Limit
AAC	Annual Allowable Cut
NWFP	Non-Wood Forest Produce
DoFPS	Department of Forest and Park Services
SRFL	State Reserve Forest Land
PFMP	Participatory Forest Management Project
Tor	Terms of Reference

Glossary

Geog	Block
Chiwog	Sub-Block
Thram	Land registration number
Gung	House number
Tsim	Roof strut
Cham	Beam/rafter
Dangchung	Poles
Drashing	Trees above 4' girth
Dzongdag	Head of the district
Dzongkhag	District
Gup	Head man of the Block
Resoop	Forest watchman

Acknowledgement

Upon the successful Completion of the Community Forest review, we the CFMG members of Norbuling CF under Lodama village under Norbuling Chiwog, Trashiding geog are truly grateful to all the individuals and the institutions for rendering the helping hand from the time of establishment of the CF till the Revision of the CFMP and by-laws. We have successfully completed our first plan period of 10 years and gained lots of knowledge and experiences to manage the CF.

Firstly, we would like to extend our gratitude to our funding agencies i.e PFMP/SFED and WWF Bhutan who funded during CF establishment and the CF Revision respectively. Secondly, we are very grateful to the Dagana Forest Division Office, SFES head and forestry staff who were involved during the CF establishment, CFMP implementation and revision to give the technical support.

We are thankful to the Geog administration for helping us whenever we need any helping hand especially in conflict resolving with outsiders. Lastly, we are very thankful to all other stakeholders who benefited us directly or indirectly in managing the CF and helped us to reach this far. We are looking forward to receiving similar support in future as well.

Executive Summary

The Norbuling community Forest is located at Lodama village, Norbuling Chiwog under Trashiding Geog of Dagana Dzongkhag. It was established in 2011 and completed its 10-year management plan tenure in 2021. The CF was established with funding support from PFMP/SFED with technical support from Dzongkhag forestry sector. The CF was comprised of 25 HH in the beginning and latter 4 members withdrew their membership and now it of 21 HH as the CFMG. After completion of the first plan period (2011-2021) in 2021, the CFMP and by-laws were revised in 2021. The total area of the CF is 48.44 ha, and it could not be extended as there is limited SRFL nearby though CFMG are eligible for area extension in accordance with the section 75 of the FNCRR-2017.

CF is located in warm broadleaved forest with an altitude ranging from 1100-1400 meter above the sea level with the dominating timber species like Lampatay (*Duabanga grandiflora*), Gokul (*Ailanthus grandis*), Maina (*Tetrameles nudiflora*) and Amritay. The CF is divided into two blocks namely Barpakha (Block-I) and Hatipailay Block (Block-II). Forest condition of Barpakha is poor stock with less critical catchment area while forest condition of Hatipailay Block is good with less critical catchment area. The average basal area of CF is 30.31 m²/ha. The AAC of the CF is 8 No drashing, 7 No cham, 4 no of Tsim, 25 no of post/poles and 6 no of firewood for next ten year.

Since the establishment of the CF, the CFMG have protected the resources from outsider as well as used the resources sustainably (as per the AHL). In the last ten years 20 households benefitted with the allotment of timber. CFMG generated the total income of Nu..... in last 10 years from various sources like product fee, fines from absentees and annual membership fee.

This management plan is divided into two parts namely Part-A CFMP and Part-B By-laws. CFMP mainly covers the status of forest, Annual work Plan and Annual Allowable cut of CF while By-laws covers the basic rules to be followed by CFMG and ToR of CFMG and CF management committee for the smooth functioning of the CF.

The CFMG have formed the CF management committee composed of the chairperson, secretary and the treasure who were elected through secret voting and their terms of reference is clearly reflected in the by-laws for the smooth functioning of the CF.

PART – A: COMMUNITY FOREST MANAGEMENT PLAN

1 Introduction

After the awareness campaign by the Geog Forestry Extension Agent, a group of 25 HH from Loduma village under Norbuling Chiwog, Trashiding geog came forward to form CFMG with the aim to bring the forestry resources within their vicinity forest under sustainable management. Accordingly with the funding support from PFMP/SFED and technical support from the Dzongkhag Forestry Section of Dagana Dzongkhag, the Norbuling Community Forest was established in 2011.

CF completed its first plan period of 10 years in 2021 and CF revision was carried out with the funding support from WWF Bhutan and technical support from Forestry of Dagana Forest Division. Resource assessment was carried out with systematic square grid laid in QGIS. Total of 75 numbers of sample plots were laid across 48 ha of area. The circular plots of 12.62m radius (major plot) for trees and 3.57m radius (minor) for regeneration were used during the time of enumeration. From the total area of 48 ha the net production area is 38.61 ha.

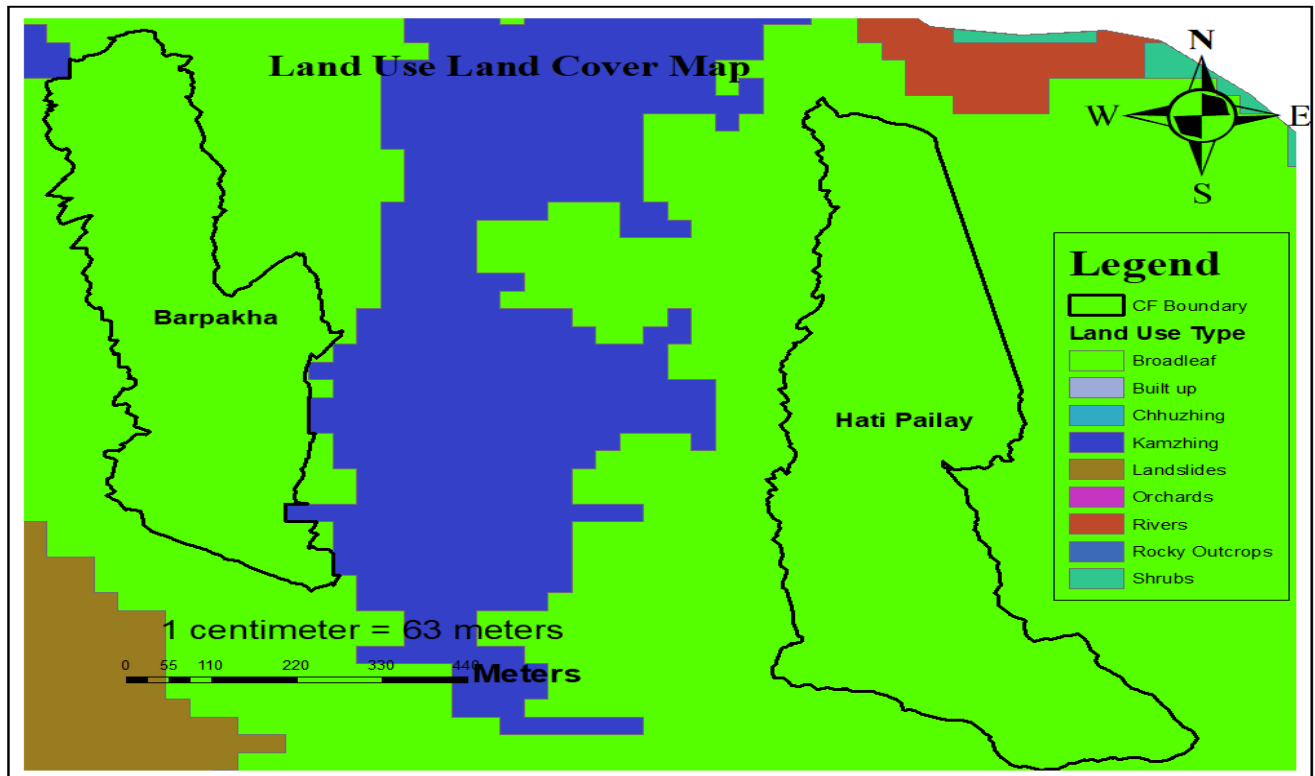
The Community Forest consists of 21 HH and it is dominated by Lhotshampas of Tamang ethnicity. The CF is divided into two blocks namely Barpakha Block and Hatipailay Block with the warm broad-leaved forest. The altitude of CF ranges from 1100-1400 meters above sea level. The CF is connected by Farm Road to Loduma village and is located 6 km from the Trashiding Geog Centre.

2 Map showing Location of Norbuling CF

Norbuling CF is located in Lodama village under Norbuling Chiwog, Trashiding Chiwog. CF covers the two sides of the village. The CF is connected with the farm road of Loduma village. Barpakha Block shares the boundary with Footpath from Loduma to Tashiding in the south, footpath from Loduma to Namchella in the North. In the west it starts from Miss Chandra Maya's Pvt. Land till Laksuma's pvt. Land and in the east it starts from footpath near Aita Sing Shangdan's pvt. Land till Kopani Dangra. Likewise, Hatipailay Block shares the boundary with Bararay Dangra in the North, footpath to Mesray's house in the south, Footpath to Daray till tek Bdr's pvt. Land in the East and Kapasay Dara till Gurdum Dara in the west.

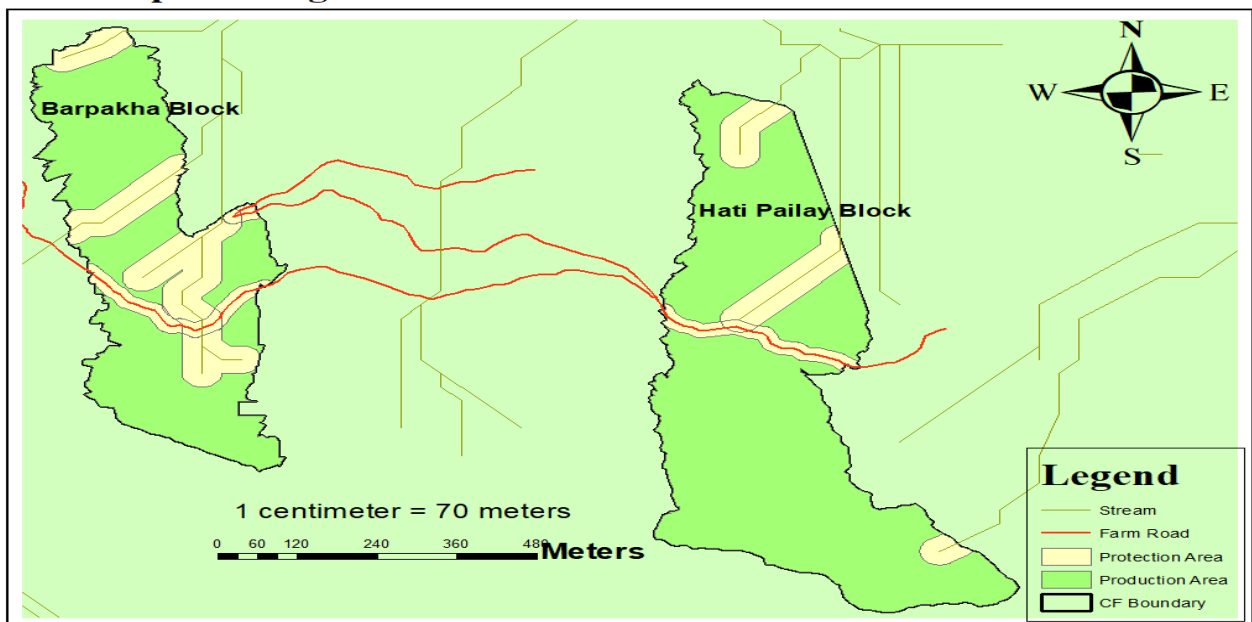


3 Land Use and Land Cover Map



4 Production Area Map

Map Showing Production & Protection Area



5 Community Forest Boundaries

Boundaries	Barpakha	Hati Pailay
East	Aitasingh's Pvt. Land till Koapani Dangra	Footpath to Daray till Tek Bdr's Pvt. Land.
West	Miss Chandra's Pvt land till Laksuman's Pvt. Land.	Kapasay Dangra till Gurdum Dangra
North	Loduma to Namchella Footpath	Bararay Dangra
South	Loduma to Tashiding footpath	Footpath to Mesray's house

6. Social Information

Social information of the CFMG is collected to get the general idea on the social and economic status of the village, living standard and their dependency on the forestry resources. The social information of Lodama village is mentioned in the table below:

Name of Village	Lodama
Ethnic Group	Lhotshampa (Tamang and Rai)
Basic Amenities	Farm Raod, Electricity, Mobile network and Meeting Hall
Total HH Number of CFMG	37
Total Human Popoulatin	245
Students	30
Civil servants	14
Total wet land	3 acres
Total Dry Land	64
Orchard	0
Two Storied House	2
Single Storied House	23
Hut	Nill
Cattle Population	112
Pig Population	13
Goat Population	21
Poultry Farm	Nill
No ofLivestock Farm	Nill
Cropping Pattern	Mixed Cropping
Off Farm Activities	Wage labour in construction site, carpentry, Power Chain operation and community contract.
Main Source of Income	Mandarin, Cardamom, piggery, wage, remittance from govt.

	employees.
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6 Block Information

Considering the landscape of the CF, it is divided into two Blocks namely Barpakha Block (Block-I) and Hatipailay Block (Block-II). The Forest Condition, catchment condition, biotic pressure of the CF is clearly reflected.

Format 1. Forest Resource Assessment (Block-I)	
Name of CF	Norbuling
Date of Assessment	09/11/2021
Name of Block	Barpakha
Block Area	19.53 ha
Basal Area of Block	13.07m ² /ha (T-7.94, N-5.13)
Name of Recorder	Dorji Thinley, Jigme wangchuk, Karna Bdr Kharka & Pem Dorji Tamang

Forest & Habitat Type (Tick all those present, refer definition below)			
Forest <input checked="" type="checkbox"/>	Thicket/pole stage <input checked="" type="checkbox"/>	Shrubland <input type="checkbox"/>	
Grassland <input type="checkbox"/>	Plantation <input checked="" type="checkbox"/>	Other <input type="checkbox"/>	
Vegetation Type			
Subtropical Forest <input type="checkbox"/>	Chir pine Forest <input type="checkbox"/>	Warm Broad leaved Forest <input checked="" type="checkbox"/>	Blue pine Forest <input type="checkbox"/>
Cool Broadleaved Forest <input type="checkbox"/>	Mixed conifer Forest <input type="checkbox"/>	Fir Forest <input type="checkbox"/>	Others <input type="checkbox"/>

Forest Condition	
Write the Names of main tree species	
Local Name	Scientific Name
Aule Champ	<i>Michelia champaca</i>
Lampatay	<i>Duabanga grandiflora</i>
Angaray	<i>Phoebe altenuata</i>
Plantation	
Is there any plantation? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Approximate height of planted tree(m)- 2 meter

Year planted	2018	Is the Plantation?	Under stocked <input checked="" type="checkbox"/>
			Stocked <input type="checkbox"/>
			Overstocked <input type="checkbox"/>
Forest Condition-Age			
Mature <input type="checkbox"/> Main Canopy of Mature trees	Pole Stage <input checked="" type="checkbox"/> Main canopy of pole-stage trees	Shrub <input type="checkbox"/> Main canopy of shrubs, young trees, or regeneration	Any <input type="checkbox"/> No continuous canopy. Isolated trees only.

Forest Condition- Canopy density		
Dense <input type="checkbox"/> Canopy density > 70%	Open <input checked="" type="checkbox"/> Canopy Density < 70%	Very Open <input type="checkbox"/> No real canopy. Isolated trees only

Forest Condition – Regeneration (including coppice regrowth)		
Abundant <input type="checkbox"/> Regeneration easy to find in most of the places	Scattered <input checked="" type="checkbox"/> Regeneration only in some places and hard to find.	None <input type="checkbox"/> No regeneration
Write the names of the 3 main species in the regeneration		
1. Baepari	2. Seto serie	3. Lampatay
Regeneration: Seedlings > 30cm and < 1.3m height		

Forest Condition – Approximate density of seed trees		
High <input type="checkbox"/> > 50 seed trees per ha	Moderate <input type="checkbox"/> 10-50 seed trees per ha	Low <input checked="" type="checkbox"/> < 10 seed trees per ha

Block Condition- summary (Use the forest condition class box below to get an average condition for the block)			
Poor <input checked="" type="checkbox"/>	Average <input type="checkbox"/>	Good <input type="checkbox"/>	very Good <input type="checkbox"/>
Does the main forest canopy consist of Large Mature trees?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Open Spaces	
Approximate total open area (ha)	2-3
Dominant vegetation type in open space	Grass (nettle plant, fern, achamay and mikanay lhara).
Cause of open space eg. Grazing, fire, harvesting, etc.	Grazing, harvesting of timber & developmental activities.

Grazing and Fodder			
Grass Land Type			
Natural <input checked="" type="checkbox"/>	Man-made <input type="checkbox"/>	Mixture <input type="checkbox"/>	Predominantly forest <input type="checkbox"/>
Main Fodder Species used (list only 3)			

Local Name	Scientific Name
Lute khanew	<i>Ficus cunii</i>
Amliso	<i>Thysaenolena maxima</i>
Tanki	<i>Bhaunia purpurea</i>

Pasture Quality (list 3 dominant species in the grassland)		
Local Name	Scientific Name	Palatable/unpalatable
Sisnoo	<i>Girardina diversifolia, Urtica spp</i>	Palatable
Achamay	<i>Chromolena odorata</i>	Unpalatable
Niguro/Fern		Palatable

Use Pattern	Seasonal <input type="checkbox"/>	All year <input checked="" type="checkbox"/>
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Type of User	Migratory <input type="checkbox"/>	Local <input checked="" type="checkbox"/>	Both <input type="checkbox"/>
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Catchment Condition	
(i) Catchment Condition- Soil Cover	
Soil Cover	Soil Cover Class
>50% of the soil are covered by vegetation	High <input type="checkbox"/>
25-50% of the soil area covered by vegetation	Moderate <input checked="" type="checkbox"/>
<25% of the soils are covered by vegetation	Low <input type="checkbox"/>
(ii) Catchment Condition – Soil type and erosivity	
Soil Type (Colour, texture, and type)	
Erosive <input type="checkbox"/>	Non-erosive <input checked="" type="checkbox"/>
Disperses and /breaks up in water easily	Stable to water flow
(iii) Catchment condition – Slope	
Slope (Degrees)	Slope Steepness class
<10 °	Gentle <input type="checkbox"/>
10 °-30 °	Moderate <input type="checkbox"/>
>30 °	Steep <input checked="" type="checkbox"/>
Catchment Condition – Summary (use the catchment condition Class box below to get the average condition for the block).	
Less Critical <input checked="" type="checkbox"/>	Moderately Critical <input type="checkbox"/>
Highly Critical <input type="checkbox"/>	

Fauna (list any animal or Bird species which area known from the Block)	
Local Name	Scientific Name
Mirga	<i>Muntiacus munjtak</i>
Thar	<i>Hemitragus jemlahicus</i>
Dhanes	<i>Aceros nipalensis</i>
Bondael	<i>Sus scrofa</i>

Biotic Pressure (tick those present)			
Fire	Common <input type="checkbox"/>	Occasional <input type="checkbox"/>	Absent <input checked="" type="checkbox"/>
Grazing	Heavy <input type="checkbox"/>	Limited <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Fodder collection	Common <input type="checkbox"/>	Limited <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
NWFP collection	Common <input type="checkbox"/>	Limited <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Leaf litter collection	Common <input type="checkbox"/>	Limited <input type="checkbox"/>	Absent <input checked="" type="checkbox"/>
Encroachment	Common <input type="checkbox"/>	Occasional <input type="checkbox"/>	Absent <input checked="" type="checkbox"/>
Pole harvesting	Common <input type="checkbox"/>	Occasional <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Fuel wood harvesting	Common <input type="checkbox"/>	Occasional <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Timber harvesting	Common <input type="checkbox"/>	Occasional <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Hunting	Common <input type="checkbox"/>	Occasional <input type="checkbox"/>	Absent <input checked="" type="checkbox"/>
Others (describe)			

Potential Management Options	
1.	Plantation in barren and degraded area
2.	Reduce grazing
3.	Identify and retain seed tree

Annual Allowable Cut of Barpakha						
ACC	Drashing	Cham	Tsim	Dangchung	Post	Fuel wood
Cubic meter	8.20	0.52	0.63	0.19	1.70	3.67
CFT	289.54	18.36	22.25	6.71	60.03	129.59
Number	3	1	2	2	5	2

Format 1. Forest Resource Assessment (Block-II)	
Name of CF	Norbuling
Date of Assessment	10/11/2021
Name of Block	Hatipailay
Block Area	28.91 ha
Basal Area of Block	17.24 (T-9.36, N-7.88)
Name of Recorders	Dorji Thinley (FO), Jigme wangchuk (FO), Karna Bdr Kharka (FR-I) & Pem Dorji Tamang (Sr.Fr.)

Forest & Habitat Type (Tick all those present, refer definition below)			
Forest <input checked="" type="checkbox"/>	Thicket/pole stage <input checked="" type="checkbox"/>	Shrubland <input type="checkbox"/>	
Grassland <input type="checkbox"/>	Plantation <input checked="" type="checkbox"/>	Other <input type="checkbox"/>	
Vegetation Type			
Subtropical Forest <input type="checkbox"/>	Chir pine Forest <input type="checkbox"/>	Warm Broad leaved Forest <input checked="" type="checkbox"/>	Blue pine Forest <input type="checkbox"/>
Cool Broadleaved Forest <input type="checkbox"/>	Mixed conifer Forest <input type="checkbox"/>	Fir Forest <input type="checkbox"/>	Others <input type="checkbox"/>

Forest Condition	
Write the Names of main tree species	
Local Name	Scientific Name
Maina	<i>Tetrameles nudiflora</i>
Seto seris	<i>Albizia procera</i>
Angaray	<i>Phoebe altenuata</i>
Plantation	
Is there any plantation? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Approximate height of planted tree(m)- 2 meter
Year planted 2018	Is the Plantation? Under stocked <input checked="" type="checkbox"/> Stocked <input type="checkbox"/> Overstocked <input type="checkbox"/>
Forest Condition-Age	
Mature <input checked="" type="checkbox"/> Main Canopy of Mature trees	Pole Stage <input checked="" type="checkbox"/> Main canopy of pole-stage trees
Shrub <input type="checkbox"/> Main canopy of shrubs, young trees, or regeneration	Any <input type="checkbox"/> No continuous canopy. Isolated trees only.

Forest Condition- Canopy density		
Dense <input checked="" type="checkbox"/> Canopy density > 70%	Open <input type="checkbox"/> Canopy Density < 70%	Very Open <input type="checkbox"/> No real canopy. Isolated trees only

Forest Condition – Regeneration (including coppice regrowth)		
Abundant <input type="checkbox"/> Regeneration easy to find in most of the places	Scattered <input checked="" type="checkbox"/> Regeneration only in some places and hard to find.	None <input type="checkbox"/> No regeneration
Write the names of the 3 main species in the regeneration		
1. Baepari	2. Seto seris	3. Lampatay

Regeneration: Seedlings>30cm and <1.3m height

Forest Condition – Approximate density of seed trees		
High <input type="checkbox"/> >50 seed trees per ha	Moderate <input checked="" type="checkbox"/> 10-50 seed trees per ha	Low <input type="checkbox"/> <10 seed trees per ha

Block Condition- summary		
(Use the forest condition class box below to get an average condition for the block)		
Poor <input type="checkbox"/>	Average <input type="checkbox"/>	Good <input checked="" type="checkbox"/>
Does the main forest canopy consist of Large Mature trees?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Open Spaces	
Approximate total open area (ha)	1 ha
Dominant vegetation type in open space	Grass (nettle plant, fern, achamay and mikanay lhara).
Cause of open space eg. Grazing, fire, harvesting, etc.	Grazing, harvesting of timber & developmental activities.

Grazing and Fodder			
Grass Land Type			
Natural <input type="checkbox"/>	Man-made <input type="checkbox"/>	Mixture <input type="checkbox"/>	Predominantly forest <input checked="" type="checkbox"/>
Main Fodder Species used (list only 3)			
Local Name	Scientific Name		
Lute khanew	<i>Ficus cunii</i>		
Amliso	<i>Thysanotus maxima</i>		
Chuletro	<i>Brasiopsis hainla</i>		

Pasture Quality (list 3 dominant species in the grassland)		
Local Name	Scientific Name	Palatable/unpalatable
Sisnoo	<i>Girardinia diversifolia, Urtica spp</i>	Palatable
Thotnay	<i>Acogonon molle</i>	palatable
Niguro/Fern		Palatable

Use Pattern	Seasonal <input checked="" type="checkbox"/>	All year <input type="checkbox"/>
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Type of User	Migratory <input type="checkbox"/>	Local <input checked="" type="checkbox"/>	Both <input type="checkbox"/>
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Catchment Condition	
(iv) Catchment Condition- Soil Cover	
Soil Cover	Soil Cover Class

>50% of the soil are covered by vegetation	High	<input type="checkbox"/>
25-50% of the soil area covered by vegetation	Moderate	<input checked="" type="checkbox"/>
<25% of the soils are covered by vegetation	Low	<input type="checkbox"/>
(v) Catchment Condition – Soil type and erosivity		
Soil Type (Colour, texture, and type)		
Erosive <input type="checkbox"/>	Non-erosive <input checked="" type="checkbox"/>	
Disperses and /breaks up in water easily	Stable to water flow	
(vi) Catchment condition – Slope		
Slope (Degrees)	Slope Steepness class	
<10 °	Gentle	<input type="checkbox"/>
10 °-30 °	Moderate	<input checked="" type="checkbox"/>
>30 °	Steep	<input type="checkbox"/>
Catchment Condition – Summary (use the catchment condition Class box below to get the average condition for the block).		
Less Critical <input checked="" type="checkbox"/>	Moderately Critical <input type="checkbox"/>	Highly Critical <input type="checkbox"/>

Fauna (list any animal or Bird species which area known from the Block)	
Local Name	Scientific Name
Mirga	<i>Muntiacus muntjak</i>
Thar	<i>Hemitragus jemlahicus</i>
Dhanes	<i>Aceros nipalensis</i>
Bondael	<i>Sus scrofa</i>

Biotic Pressure (tick those present)			
Fire	Common <input type="checkbox"/>	Occasional <input type="checkbox"/>	Absent <input checked="" type="checkbox"/>
Grazing	Heavy <input checked="" type="checkbox"/>	Limited <input type="checkbox"/>	Absent <input type="checkbox"/>
Fodder collection	Common <input checked="" type="checkbox"/>	Limited <input type="checkbox"/>	Absent <input type="checkbox"/>
NWFP collection	Common <input type="checkbox"/>	Limited <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Leaf litter collection	Common <input type="checkbox"/>	Limited <input type="checkbox"/>	Absent <input checked="" type="checkbox"/>
Encroachment	Common <input type="checkbox"/>	Occasional	Absent <input checked="" type="checkbox"/>
Pole harvesting	Common <input type="checkbox"/>	Occasional <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Fuel wood harvesting	Common <input checked="" type="checkbox"/>	Occasional <input type="checkbox"/>	Absent <input type="checkbox"/>
Timber harvesting	Common <input type="checkbox"/>	Occasional <input checked="" type="checkbox"/>	Absent <input type="checkbox"/>
Hunting	Common <input type="checkbox"/>	Occasional <input type="checkbox"/>	Absent <input checked="" type="checkbox"/>
Others (describe)			

Potential Management Options	
1.	Plantation in barren and degraded area
2.	Reduce grazing
3.	Identify and retain seed tree

Annual Allowable Cut Hati Pailay Block						
ACC	Drashing	Cham	Tsim	Dangchung	Post	Fuelwood
M3	14.32	4.48	0.67	0.51	5.96	9.13
CFT	505.64	158.19	23.66	18.01	210.45	322.38
Number	5	6	2	6	20	4

7 Annual Allowable Cut of Entire CF

Annual Allowable Cut of Entire CF						
ACC	Drashing	Cham	Tsim	Dangchung	Post	Fuel wood
Cubic Meter	22.52	5	1.3	0.7	7.66	12.8
CFT	795.18	176.55	45.90	24.72	270.47	451.97
Numbers	8	7	4	8	25	6

8 Forest Management

Forest Management Objectives:

1. Sustainable management and use of Forest Resources
2. Conservation of degraded area
3. Income generation
4. Curbe illegal activities
5. Improve Forest Condition

9 Forest Product Demand Assessment

Produce	Annual Requirement (Estimated)		No of HH that require that produce annually (C)	Total requirement of produce (annually)		Total requirement of produce in years 10	
	Number (A)	Volume in cft (B)		Number (A*C) =D	Volume (cft) (B*C) =E	Number D*10	Volume (cft) (E*10)
For new Construction							
Drashing	5	1000	4	20	5000	200	50000

Cham	CFMG don't prefer to harvest cham size timber. The Demand of Cham is included in drashing.						
Tsim	CFMG don't prefer to harvest Tsim size timber. The Demand of tsim is included in drashing.						
Dangchung	CFMG don't prefer to harvest dangchubg size timber.						
For Renovation							
Drashing	2	500	4	8	2000	80	20000
Other Construction							
Drashing	1	200	3	3	600	30	6000
Other Forest Produce							
Firewood	2	200	21	42	4200	420	42000
Post/poles	20	50	10	200	500	2000	5000
Stone	10TL	80m ³	7	70TL	560m ³	700TL	5600m ³

11.1. Comparison of AAC and Demand of CFMG

Produce	Total AAC		Total Annual Demand		Differences		Remarks
	No of Trees	Volume (cft)	No of Trees	Volume (cft)	No of trees	Volume in (cft)	
Drashing	8	795.18	31	7600	-23	-6804.82	Insufficient
Cham	7	176.55	0	0	7	176.55	-
Tsim	4	45	0	0	4	45	-
Dangchung	8	24.72	0	0	8	24.72	-
Post/poles	25	270.47	200	500	-175	-300	Insufficient
Firewood	6	451.97	42	4200	-36	-3748.03	Insufficient

10 Participatory Environment Assessment Chart

Participatory Environment Assessment Format								
Activity proposed in CF	Potential Environmental Effect				Potential Socio-economic Effect			
	Soil	Water	Wild Animal	Plants	Traditional Forest use	Cultural & religious value	Local Employment	Local Benefit from Forest Produce
Timber & Fuel wood harvesting	----	---	--	----	+	+	+++	+++
Plantation	++ +++	+++ ++	0	+	-	0	+++	++
Thinning &	---	---	--	+++	0	0	++	++

Cleaning								
Patrolling	+++	+++ ++	++++	+++	0	0	++	+++
NWFP collection	----	---	----	-	+	0	++	++++
Grazing Control	++ ++ +	+++ ++	++	+++ ++	0	0	-	+++
Control tree felling nearby water source	++ +	+++ ++	++	+++ ++	0	0	0	+++++

Index	
+	Positive Effects
-	Negative Effects
0	No Effect

12.1. Procedure to Mitigate Negative Environmental Effect

Mitigation Measures for Negative Environmental Effect	
Activity	Procedure
Timber Harvesting	Felling of trees on slopes greater than 45° will be restricted.
	Felling of trees within 30m of river and 15m farm road will be restricted.
	Rolling and dragging of logs will be restricted.
	Timber harvesting will be based on Annual allowable cut.
Thinning and cleaning	Thinning and cleaning around water source will not be permitted
	Thinning and cleaning shall not be permitted in degraded area.
NWFP collection	Follow the guideline of the particular NWFP if available
	Restrict the harvesting in off season
	Avoid excessive harvesting

12.2. Climate Hazard Assessment

	Land slide	Flood	Drought	Forest fire	Animal Disease	Reduced Crop Yield
Landslide	X					

Flood	Landslide	X				
Drought	Drought	Drought	X			
Forest Fire	Landslide	Forest Fire	Drought	X		
Animal Disease	Landslide	Animal Disease	Drought	Animal Disease	X	
Reduced Crop Yield	Reduced Crop yield	Reduced Crop Yield	Drought	Reduced Crop Yield	Reduced Crop Yield	X
Result: 1 st = Drought(5times), 2 nd = Reduced crop Yield (4times), 3 rd = Land Slide (3 times), 4 th = Animal Disease, 5 th =Forest Fire (1time), 6 th = Flood(0)						

12.3. Climate Vulnerability Assessment

Social Group	Landslide	Flood	Drought	Forest fire	Animal Disease	Reduced Crop Yield
Rich Member	2	2	3	1	2	2
Medium Member	2	2	3	2	3	3
Poor Member	3	3	4	3	4	4
Forestry sector	4	4	4	4	1	0
Agriculture sector	4	4	4	0	1	4
Livestock Sector	3	3	4	0	4	1
0=Not vulnerable, 1= Low Vulnerability, 2=medium vulnerability, 3=high vulnerability, 4= very high Vulnerability						

11 Forest Produce Preference Ranking Matrix

Products	Timber	Firewood	Water	Grazing	Bamboo	Fodder	NWFP
-----------------	---------------	-----------------	--------------	----------------	---------------	---------------	-------------

Timber	X						
Firewood	Timber	X					
Water	Water	Water	X				
Grazing	Timber	Grazing	Water	X			
Bamboo	Timber	Bamboo	Water	Bamboo	X		
Fodder	Timber	Firewood	Water	Grazing	Bamboo	X	
NWFP	Timber	Firewood	Water	Grazing	Bamboo	Fodder	X
Result: 1 st = Water (6), 2 nd = Timber (5), 3 rd = Bamboo (4), 4 th = Grazing (3times), 5 th = Firewood, 6 th = Fodder, 7 th = NWFP (0)							

12 Forest Products Prioritization Matrix

Species Local Name	Uses	Drashing	Champ	Tsim	Flagpole & Post	Firewood	Fodder
Kimbu	Preference	Xxxxx	xxxxxx	xxx	xx	x	xxx
	Availability	*	*	*	-	-	**
Champ	Preference	Xxxxx	xxxxxx	x	x	x	x
	Availability	*	*	*	*	-	-
Lampatay	Preference	Xxxxx	xxxxxx	x	xx	x	x
	Availability	***	***	****	****	***	****
Pani Saj	Preference	Xxx	xx	x	x	xx	x
	Availability	*	*	*	*	*	*
Bakanay	Preference	Xxx	xxx	xx	xx	x	x
	Availability	***	**	**	**	*	***
Lali	Preference	Xxx	xx	-	-	xx	-
	Availability	*	*	-	-	**	-
Angaray	Preference	Xxxxx	xxxxx	x	-	xxx	-
	Availability	*	*	*	-	*	-
Amp (wild mango)	Preference	Xx	x	-	-	x	x
	Availability	*	*	-	-	*	*
Ambakay	Preference	Xx	xxxx	xxxx	xx	xxx	x
	Availability	***	***	**	**	**	***
Tuni	Preference	Xx	x	x	x	-	-
	Availability	*	*	*	*	-	-
Mandanay	Preference	Xxx	xxx	xx	x	x	x
	Availability	***	**	*	**	***	***
Maina	Preference	X	x	x	-	x	-
	Availability	***	****	****	-	*	-
Simal	Preference	X	-	-	xx	x	x

	Availability	**	-	-	**	*	**
Kaizal	Preference	Xx	x	-	xx	xx	x
	Availability	*	*	-	**	**	*
Dapdappay	Preference	Xx	xx	-	xx	x	xx
	Availability	*	*	-	*	*	**
Hatipailay	Preference	X	x	-	-	xx	x
	Availability	*	*	-	-	**	**
Kalikat	Preference	Xxx	xx	xx	-	-	-
	Availability	*	*	*	-	-	-
Rato Siris	Preference	Xx	-	-	xx	xx	xxx
	Availability	*	-	-	**	**	***
Seto siris	Preference	-	-	-	-	xxx	xx
	Availability	-	-	-	-	*****	***
<i>Note: xxxxx- Highly Preferred x-Least Preferred</i> <i>*****-Highly Available *-Little Available</i>							

13 Monitoring Plan

17.1. Participatory Forest Resource Monitoring				
Objective	Indicator	How it will be monitored	Responsibility	Comments
Sustainable Management & use of Forest resources	Annual Harvesting limit	By checking the forest resources are harvested as per the annual harvesting limit.	CFMG committee members	Concern Forestry officer in-charge will verify annually
	Evidence of illegal felling of trees	Report from CFMGmembers	CFMG management committee & members	
	Increase in vegetation Cover	CFMG shall visit the CF area and assess the Forest condition	CFMG committee & members	Territorial Forest Division shall support.
Protection of Forest produce from outsider	Detection of illegal activities by outsider	Referring the record of illegal activities.	CFMG committee members	Territorial Forest Division shall support.
To improve forest Condition	Regeneration status	Identify a plot and count the number of seedlings	CFMG management committee and members	Concern Ranger/In-charge shall give technical support.
	Canopy density	Ocular measurement of canopy density in percentage	CFMG management committee& members	-
Conservation of	Number of	- Referring the	CFMG committee	-

degraded area	seedlings planted	plantation record. - Checking survival & growth of the planted seedlings.	members	
Income Generation	Increase in Annual income of CFMG	Checking the Financial status of CF	CFMG committee members	-
	Availability of Forest produces.	From CF record.	CFMG committee members	-

17.2. Participatory Social and Institutional Monitoring				
Activity	Indicator	How it will be monitored?	Responsibility	Comments
CFMG general meeting	No. of participants in the meeting.	Minutes of meeting and participants register	Chairperson of the CF.	Maintain the records of every meeting.
Resources allocation based on equity.	Number of single women headed household & number of disadvantaged households	Record Books.	CFMG management committees	-
Providing Loan to CFMG members	Number of HH who availed loan.	Financial management record.	CFMG committee members with support from concern forestry in-charge.	Keep clean financial record.
Review of Socio-economic survey	No of disadvantaged HH & No of HH headed by single women.	Participatory review	CF management committee with concern agency.	-
CF program/Activities	No. of participants during program.	Record of registration book	CFMG members	Participants Registration during CF programs/activities.

14 Annual Work Plan

Activities	International Calender												Responsibility
	1	2	3	4	5	6	7	8	9	10	11	12	
Plantation Creation.													CFMG
Cleaning & weeding of plantation.													CFMG
Patrolling													Resoop
Marking													Forestry In-charge
Thinning													CFMG
Harvesting of Timber													Concern Applicant
General Meeting													CFMG
Boundary Demarcation													CFMG

15 Work Plan for Ten Years

Work Plan For Ten Years													
Activities	Calendar Year												Responsibility
	1	2	3	4	5	6	7	8	9	10	11	12	
Plantation Creation													CFMG member
Cleaning & weeding of Plantation													CFMG member
Patrolling													Resoop
Marking													Forestry staff and concern applicant
Thinning													Forestry staff and CFMG
Harvesting of Timber													Concern Applicant
General Meeting													CFMG members
Boundary Demarcation													CFMG members

PART-B: BY-LAWS

16 CFMG Name

There is no change in the name of Community Forest, and it shall remain as Norbuling Community Forest Management Group as before.

17 Membership Arrangement

18.1. Eligibility Criteria

Anyone who holds Gung (house No.) in the Norbuling village and is Head of Household is eligible to join the CFMG.

18.2. Procedure for New Membership registration

- i. A person who is willing to join the CFMG shall submit the duly filled up CFMG New Membership application Form (Annex.12) to the Chairperson.
- ii. CFMG committee shall verify the application and approve or reject it.
- iii. Any New member willing to join shall compensate 100% share of membership fee and the labour contribution made by the existing members, calculated at the rate of Nu.215/-per day for labour contribution.
- iv. The new member who is separated from the gung of existing members shall compensate 50% share of the membership fee and the labour contribution made by the existing members, calculated at the rate of Nu.215/ per day for labour contribution.

19.3. Procedure for the withdrawal of the Membership

- i. A member willing to withdraw from the CFMG membership must submit the duly filled application Form (ANNEX.13) to the CFMG management committee & he/she must clear all the dues prior to withdrawal.
- ii. The withdrawn member shall not be eligible for any benefit from the CF.
- iii. Withdrawn members shall not be allowed to rejoin.
- iv. Separated gung of the resigned member shall be eligible for new membership upon payment of compensation as per section 18.2. (iii).
- v. Chairperson shall submit the detailed record of benefit availed by the resigned member.

18 CF Management Committee

CF Management committee is composed of three posts in CFMG namely Chairperson, Secretary and Treasurer. These posts are elected through secret voting by the CFMG members. The CF management committee shall serve a minimum of 5 years and then only resign from the committee if there is capable

member to replace him or her. There should be proper handing & taking between old and new postholders as per the Annex.16. CF management committee members shall be terminated if there is any corrupt practice by concern member.

For now CFMG have elected the following members in various post through secret voting:

Sl	Name	Post	Remarks
1.	Thag BdrRai	Chairperson	Continued from pervious term
2.	Lain BdrRai	Secretary	Continued from pervious term
3.	Lachuman Bomzan	Treasurer	Continued from pervious term
In order to curve the illegal activities within the CF, CFMG also nominated following member as a Resoop. The term of the Resoop shall be minimum of 5 years.			
1.	Nar Bdr Dumzan	Resoop	
2.	Harka Bdr Glan	Resoop	

19 Terms of Reference of CF management committee

21.1. ToR of CF Management committee

- i. Represent the CFMG in its interactions with other agencies including the forestry staff.
- ii. Represent the CFMG members during the preparation and implementation of CFMP.
- iii. Coordinate and organize the administration of CF activities and operations and ensure that CFMG members fulfill their management responsibilities.
- iv. Responsible for the equitable distribution of benefits amongst the CFMG members.
- v. Responsible for management of forestry resources.
- vi. Responsible for the enforcing of by-laws of the CFMG and for collecting fines and penalties.
- vii. Responsible for ensuring that all the legal requirements are met (including all types of records that need to be kept).
- viii. Responsible for establishment and maintaining the CFMG fund using monies collected from various sources.
- ix. Responsible for organizing and conducting CFMG meetings when required.

21.2. ToR of Chairperson

- i. Heads the CFMG
- ii. Calls meeting whenever necessary and informs the concerned person about date, time and place, and the reason for the meeting.

- iii. Chairs and facilitates the meetings and makes sure each and every person is allowed to speak, thereby giving everyone fair chance to speak and raise the issues.
- iv. Approves application for forest products (with secretary).
- v. Countersign financial transaction and authorization to withdraw cash from bank (with Treasurer).

21.3. ToR of Secretary

- i. Assists the Chairperson and officiate him /her during his/her absence.
- ii. Manage the correspondence (writing of letters and minutes of meetings) for CFMG.
- iii. Maintain the files of CFMG.
- iv. Maintain the List of CFMG members.
- v. Maintain the register of participants in meeting and developmental work.
- vi. Maintain record of fine and penalties.
- vii. Approve the application for forest products (with Chairperson) and issue permit.
- viii. Prepare annual progress report (with other CF management committee members).

21.4. ToR of Treasurer

- i. Looks after any financial transactions on behalf CFMG.
- ii. Keeps record of expenditure and labour contribution during CF activities.
- iii. Gives detailed account of how much money or labour has been contributed, how much has been spent and how much is still left, during annual CFMG meeting.
- iv. Prepare Annual Financial report for the CFO (with the assistance of other CF management Committee members).
- v. Countersigns the financial transaction and authorization to draw cash from the bank (with Chairperson).
- vi. Keep all record of CF activities.

21.5. ToR of Resoop

- i. Conduct Forest patrolling within the CF.
- ii. Assist the Forestry staff during CF marking and survey.
- iii. Inform the CF chairperson if there are any illegal activities in the CF area.

21.6. Eligibility for committee members

To become the member of CF management committee, he/she should meet following criteria:

- i. He/she should be able to read and write.

- ii. He/she should be mentally sound.
- iii. He/she should be of age between 18-60 years old.

20 Roles and Responsibilities of CFMG

- i. Follow the rules and procedures as outlined in CFMP and By-laws.
- ii. Participate in the CFMG planning and decision making.
- iii. Participate in CFMG meetings.
- iv. Participate/cooperate in any activities pertaining to CF.
- v. Report to CF chairperson if any illegal activities are detected.
- vi. Harvest the resource only after paying the prescribed fee and obtaining the required document.
- vii. Ensure equity amongst CFMG members.
- viii. Follow the formalities as per the CFMP and By-laws.
- ix. Members have right to enquire the CF management committee on status of CF fund.
- x. Terminate the CF management committee members if there is any corruption by concern member and elect new member.

21 Benefit Sharing Mechanism

The CFMG members have right to obtain any kind of forest products for their domestic use but they shall follow following procedure to ensure equity:

- i. The CFMG member shall get approval from Chairperson for the harvesting of any forest produce from CF area.
- ii. All the members shall obtain permit prior to harvesting of forest produce from CF area.
- iii. All the members shall collect the NWFP freely for domestic consumption from the CF however for commercial purpose applicants need to avail permit and pay royalty. Dried and fallen branches of trees can be collected freely by all the members for the purpose of fuel wood.
- iv. The CFMG members shall be allowed to collect fodder freely by only lopping without felling.
- v. CFMG can graze the cattle freely in CF area but shall be strictly restricted in water source, plantation, and other area duly protected within the CF area.
- vi. CFMG committee shall issue the permit for timber in October-December

- vii. The CFMG shall mark the tree and extract in Jan-march.
- viii. Renewal of permit shall be as per the existing rules (FNCRR-2017 & FNCRR-amendment 2020 & 2021).
- ix. CFMG member shall not be allowed to sell the any forest produce allotted to them. Sale of surplus timber shall be allowed by CF management committee after discussing with all the members.
- x. The need of timber under natural calamities will be considered differently after field verification and other procedures and steps given by the geog administration.
- xi. During timber allotment, priority shall be given to the poor household who are in genuine need of the timber.

22 Fees (Annual membership, Products & permit Fee)

24.1. Membership fee

- i. CFMG shall contribute Nu.200/-per household annually as a membership fee.
- ii. The membership fee shall be collected during the general meeting.
- iii. Fee collected shall be deposited in CFMG bank account.

24.2. Permit fee

CFMG members have decided to revise the fees for various forest produce as shown in the table below:

Product	Quantity	CFMG	Outsider
Drashing	Per tree	Nu.50/-	As per existing NRPC rate
Cham	Per tree	Nu.40/-	-do-
Pole/Tsim	Per tree	Nu.30/-	-do-
Dangchung	Per tree	Nu. 10/-	-do-
Fuel wood	Per tree	Nu.40/-	-do-
Bamboo	Per culm	Nu.5/-	100/- per culm
Stone/grable	T/L	50/-	NA

Soft broom	bundle	2/-	50/-
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23 Timber allotment for new house construction and renovation

Product	New Construction	Renovation
	Quantity (No of Trees)	Quantity (No of trees)
Drashing	5 Numbers	3 Numbers

26. Periodicity and Validity of permit

The time schedule for the allotment of different forest product from the CF shall be as follows

Type of construction	Application time	Verification time	Permit issue and marking	Validity of permit	Next allotment
New cons.	June-August	September-October	Oct- Dec	2 years	25 years
Repair	June-August	September-Oct.	Oct- Dec	1 year	12 years
Others	Any time	Anytime	Anytime	1 Year	5 years
Firewood, post,flag poles	Any time	Anytime	Anytime	3 months	Yearly

27.Financial Arrangement (fund)

27.1.Source of Fund

Following are the possible source of income for the CFMG of Norbuling CF

- i. Membership fees
- ii. Permit fees
- iii. Fine and penalties
- iv. Sale of forest products
- v. Interest returns
- vi. Donations

27.2. Fund Management

- i. The CFMG committee shall be responsible for managing the fund. The CFMG shall deposit the fund collected in the saving account of the group. The Treasure shall keep all the financial record and present to CFMG in general meeting.
- ii. CFMG shall use the fund for the development of community forest.
- iii. Loan shall be given to any CFMG members who are willing to avail it by the CF management committee.
- iv. Interest rate of loan for the CFMG shall be 1% monthly.
- v. CFMG decided to pay the allowance for CF management committee members as follows:
 1. Chairperson :Nu.1000/-annually
 2. Secretary: 500/- annually
 3. Treasurer: 500/ annually

28.Record Keeping

The CFMG shall keep the following records and concern CF management committee shall be responsible to maintain the record as mentioned below:

Sl	Records to be kept	Responsibility
1.	Fines and penalties	Secretary
2.	Seedlings & Plantation Record	Secretary
3.	Timber and firewood marking record	Secretary
4.	Minutes of meeting	Secretary
5.	Annual Progress report and work plan	Secretary
6.	Attendance register(annual labour register)	Secretary
7.	Record of Forest Product utilization	Secretary
8.	Loan Record	Treasurer
9.	Cash flow book	Chairperson & Treasurer
10.	Copy of Money receipt	Treasurer & secretary
11.	Record of all the sales of CF product	Chairperson & treasurer
12.	Transport of forest produce	Chairperson & secretary
13.	Copy of Collection permit record	Chairperson & secretary

14.	Copy of all correspondences with other agencies	Secretary
15.	Activity record	Secretary

The record maintained by the concern shall be shared with the Forestry official during the CF monitoring time.

29.Meeting

Meeting is one of the important activities of CF for the smooth functioning of the CF system and to ensure the participatory approach in decision making. The CFMG shall conduct general meeting 2 times and CF management committee and CFMG shall meet at any time if required. During the meeting, CFMG shall discuss in the community forest activities and other relevant issues. The minutes of meeting shall be maintained during every meeting.

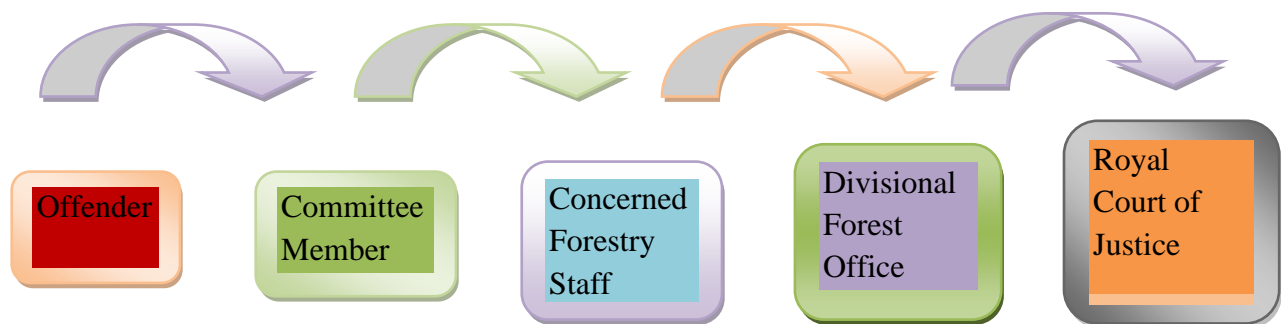
30.Offences and penalties

- i. The amount of fines and penalties for both CFMG members and outsiders related to natural resources shall be based on the provisions mentioned in the FNCRR-2017.
- ii. Fines and penalties collected from both CFMG and outsiders can be deposited in CF account as per the fund management section of the CF manual.
- iii. Fines and penalties related to wildlife hunting/poaching forest fire shall be as per the existing rules and shall be collected and deposited in government account by the forestry offices.
- iv. Grazing of cattle by the CFMG in plantation area within the CF shall be penalized with fine of Nu. 100/- per cattle and he/she has to restore the damage caused.
- v. Grazing of cattle by the outsider shall be penalized with fine of Nu.200/- per cattle and has to restore the damage caused.
- vi. Any CFMG member not attending meeting shall be penalized with fine of Nu.200/- per day. This shall be exempted if absentee is having genuine reason.
- vii. Any CFMG member not attending labour contribution shall be penalized with fine of Nu.500/- per day. This shall be exempted if absentee is having genuine reason.

- viii. Any CFMG not reporting the illegal activities detected by them and keeping it secret shall be penalized with fine of Nu.500/ per occasion.
- ix. If any outsiders report the illegal activities within the CF, he/she shall be rewarded with 50% of the total fine imposed.
- x. CFMG shall seek the assistance from the concerned forestry staff if any help is required.

31. Conflict Management

Any conflicts within the CFMG members and with the outsiders related to community forest activities shall be resolved by the CF management committee members. However if there is any conflict which could not be resolved, it shall be forwarded to higher authority as given below:



32. Amendment of CF management plan & By-laws

In case if the CFMG like to amend the CF plan and bylaws, CFMG should channel through concern Forestry In-charge (Ranger) to Forest Division Office and it will be forwarded to Department of forestand Park Services for the approval.

During the amendment and revision of CF management plan and By-laws all the CFMG should be present and atleast 70% of the member should support the amendment.

33. Power of Department (DoFPS)

DoFPS has the power to monitor and take action with regards to both forestry and developmental activities within the CF. Department of forest shall give technical support and monitor the CF and CFMG whenever necessary. The Department shall exercise its power as per Chapter III, section 105, sub-sections (1) and (2) of **Forest and Nature Conservation Rules and Regulations of Bhutan, 2017**.

In addition, the **Department of Forest** is empowered to;

- (1) Take action against violators of the Act, Rules or Management Plan, regardless of whether request by the CFMG or not;
- (2) Inspect, monitor, and review the records of and otherwise supervisions of the management plan or any provisions under this chapter;
- (3) Establish record – keeping and financial reporting obligations.

34. Annexure I: Norbuling CFMG membership list

Sl.No	Member list with Age	CID Number	House No (Ga-9- ____)	Thram NO
1.	Thag Bdr Rai	10308000551	65	218
2.	Lain Bdr Rai	10308000550	64	116
3.	Lachuman Bomzan	10308000528	57	129
4.	Harka Bdr Glan	10308000491	51	115
5.	Somser Shangdan	10308000671	37	126
6.	Dhan Bdr Shangdan	10308000505	54	121
7.	Ran Bdr Glan	10308000489	50	793
8.	Sartap Singh Glan	10308000480	49	120
9.	Prem Singh Lho	30308000018	35	128
10.	Nar Bdr Dumzan	10308000519	56	232
11.	Phalam Singh Tamang	10308000648	33	100
12.	Hasta Bdr Tamang	10308030425	28	212
13.	Phurba Singh Shangdan	10308000502	52	121
14.	Bhim Bdr Shangbo	10308000540	62	217
15.	Dhanjit Shangbo	10308000441	217	217
16.	Santa Bdr Shangbo	10308000433	216	217
17.	Amrit Shangdan	10308003584	36	127

18.	Biru Maya Shangdan	10308000588	Nill-26	121
19.	Jit Man Shangdan	10308000499	52	121
20.	Pancha Man Shangdan	10308000507	277	511
21.	Dhanjit Bomzan	10308000457	46	122

35. Annexure II- List of tree spp

Sl.no	Local Name	Scientific Name
1.	Khanew	<i>Ficus cunii</i>
2.	Guyanlo	<i>Calicarpa arborea</i>
3.	Moua	<i>Engelherdia spicata</i>
4.	Simal	<i>Bombax ceiba</i>
5.	Champ	<i>Michelia spp</i>
6.	Seto seris	<i>Albizia procera</i>
7.	Pani Saj	<i>Terminalai myriocarpa</i>
8.	Pakha Saj	<i>T. tomentosa</i>
9.	Haluray	<i>Chukrasia tabularis</i>
10.	Rato Siris	<i>Albizia lucidior</i>
11.	Malata	<i>Macaranga spp</i>
12.	Lampatay	<i>Duabanga grandiflora</i>
13.	Tuni	<i>Toona spp</i>
14.	Amritay	
15.	Bhalayo	<i>Rhus spp</i>
16.	Phalamay	<i>Walsura</i>
17.	Kalikat	<i>Sarcosperma arboreum</i>
18.	Panchpatay	<i>Vitex heterophylla</i>
19.	Gokul	<i>Ailanthus integrifolia</i>
20.	Runchey	<i>Antinodaphne obovata</i>
21.	Tarsing	<i>Beilschmedia spp</i>
22.	Kathlay	
23.	Bangi	<i>Hovenia dulcis</i>

24.	Khorsanay	
25.	Borey	
26.	Khira	<i>Wrightia arborea</i>
27.	Amaro	<i>Spondias pinnata</i>
28.	Tankey	<i>Bauhinia purpurea</i>
29.	Gayo	<i>Bridelia retusa</i>
30.	Faledo	<i>Erythrina arobrescens</i>
31.	Maina	<i>Tetrameles nudiflora</i>
32.	Dapdapay	<i>Garuga pinnata</i>
33.	Phusray	
34.	Hatipailay	<i>Pterospermum acerifolium</i>
35.	Kimbu	<i>Morus alba</i>
36.	Mandanay	<i>Acrocarpus fraxinifolius</i>
37.	Ambakay	<i>Syzigium formosum</i>
38.	Bhakimlo	<i>Rhus chinensis</i>
39.	Kawlo	<i>Persea spp</i>
40.	Lapchay	<i>Poyalthia longifolia</i>
41.	Sinduray	<i>Mallotus philippinensis</i>
42.	Aulay Pipli	<i>Ulmus lancieifolia</i>
43.	Khamari	<i>Gmelina arborea</i>
44.	Lhasunay	<i>Amoora wallichii</i>
45.	Angaray	<i>Phoebe attenuata</i>
46.	Amp	<i>Magnifera indica</i>
47.	Chuletro	<i>Brassaiopsis hainla</i>
48.	Khari	<i>Celtis tetranda</i>
49.	Jigani	<i>Eurya spp</i>
50.	Chatiwan	<i>Alastonia scholaris</i>
51.	kubinday	<i>Kydia calycina</i>
52.	Chilaune	<i>Schima wallichii</i>
53.	Setipat	

36. Annexure III: Community Forest Sample Plot with GPS Coordinates

Name	Latitude	Longitude	y_proj	x_proj
1	26.93304195	90.02148865	2980211.323	252134.1158
2	26.93304182	90.02231432	2980211.323	252216.1158
3	26.93230189	90.02148851	2980129.323	252134.1158
4	26.93230176	90.02231418	2980129.323	252216.1158
5	26.93156183	90.02148837	2980047.323	252134.1158
6	26.93156171	90.02231403	2980047.323	252216.1158
7	26.93082178	90.02148823	2979965.323	252134.1158
8	26.93082165	90.02231388	2979965.323	252216.1158
9	26.93082152	90.02313954	2979965.323	252298.1158
10	26.93008172	90.02148809	2979883.323	252134.1158
11	26.93008159	90.02231374	2979883.323	252216.1158
12	26.92934167	90.02148795	2979801.323	252134.1158
13	26.92934154	90.02231359	2979801.323	252216.1158
14	26.92934141	90.02313923	2979801.323	252298.1158
15	26.92934127	90.02396487	2979801.323	252380.1158
16	26.92860148	90.02231345	2979719.323	252216.1158
17	26.92860135	90.02313908	2979719.323	252298.1158
18	26.92860121	90.02396472	2979719.323	252380.1158
19	26.92786143	90.0223133	2979637.323	252216.1158
20	26.92786129	90.02313893	2979637.323	252298.1158
21	26.92786116	90.02396456	2979637.323	252380.1158
22	26.92712137	90.02231316	2979555.323	252216.1158
23	26.92712124	90.02313878	2979555.323	252298.1158
24	26.9271211	90.0239644	2979555.323	252380.1158

25	26.92638131	90.02231301	2979473.323	252216.1158
26	26.92638118	90.02313863	2979473.323	252298.1158
27	26.92638104	90.02396425	2979473.323	252380.1158
28	26.92564126	90.02231287	2979391.323	252216.1158
29	26.92564112	90.02313848	2979391.323	252298.1158
30	26.92564099	90.02396409	2979391.323	252380.1158
31	26.93155998	90.03139625	2980047.323	253118.1158
32	26.93155979	90.03222191	2980047.323	253200.1158
33	26.93081992	90.03139605	2979965.323	253118.1158
34	26.93081974	90.0322217	2979965.323	253200.1158
35	26.93007987	90.03139584	2979883.323	253118.1158
36	26.93007968	90.03222149	2979883.323	253200.1158
37	26.92933981	90.03139564	2979801.323	253118.1158
38	26.92933962	90.03222128	2979801.323	253200.1158
39	26.92933943	90.03304692	2979801.323	253282.1158
40	26.92859994	90.0305698	2979719.323	253036.1158
41	26.92859975	90.03139543	2979719.323	253118.1158
42	26.92859957	90.03222107	2979719.323	253200.1158
43	26.92859938	90.0330467	2979719.323	253282.1158
44	26.92785988	90.0305696	2979637.323	253036.1158
45	26.9278597	90.03139523	2979637.323	253118.1158
46	26.92785951	90.03222086	2979637.323	253200.1158
47	26.92785932	90.03304649	2979637.323	253282.1158
48	26.92711982	90.0305694	2979555.323	253036.1158
49	26.92711964	90.03139502	2979555.323	253118.1158
50	26.92711946	90.03222065	2979555.323	253200.1158
51	26.92711927	90.03304627	2979555.323	253282.1158

52	26.92637977	90.0305692	2979473.323	253036.1158
53	26.92637959	90.03139482	2979473.323	253118.1158
54	26.9263794	90.03222044	2979473.323	253200.1158
55	26.92563971	90.030569	2979391.323	253036.1158
56	26.92563953	90.03139461	2979391.323	253118.1158
57	26.92563934	90.03222022	2979391.323	253200.1158
58	26.92489965	90.0305688	2979309.323	253036.1158
59	26.92489947	90.03139441	2979309.323	253118.1158
60	26.92489929	90.03222001	2979309.323	253200.1158
61	26.9248991	90.03304562	2979309.323	253282.1158
62	26.92415942	90.0313942	2979227.323	253118.1158
63	26.92415923	90.0322198	2979227.323	253200.1158
64	26.92415904	90.03304541	2979227.323	253282.1158
65	26.92341954	90.0305684	2979145.323	253036.1158
66	26.92341936	90.031394	2979145.323	253118.1158
67	26.92341917	90.03221959	2979145.323	253200.1158
68	26.92341898	90.03304519	2979145.323	253282.1158
69	26.92341879	90.03387079	2979145.323	253364.1158
70	26.92341859	90.03469639	2979145.323	253446.1158
71	26.92267893	90.03304498	2979063.323	253282.1158
72	26.92267873	90.03387057	2979063.323	253364.1158
73	26.92267853	90.03469616	2979063.323	253446.1158
74	26.92267833	90.03552175	2979063.323	253528.1158
75	26.92193867	90.03387035	2978981.323	253364.1158

37.1.Compilation Sheet for Timber Species (Hatipailay Block)

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37.2.Compilation Sheet for Timber Species (Barpakha Block)

OPERATIONAL INVENTORY: COMPILATION SHEET (FIXED-SIZE PLOT)								
1. CF Name: Norbuling				4. Block Area				
2. Block Name: Barpakha				5. Compiling date: 1/12/2021				
3. No of plots		30		6. Species group		Broad leaf T-tree		
col1	col2	col3	col4	col5	col6	col7	col8	col9
		(3 decimals)	(3 decimals)	(3 decimals)	(0 decimals)	(2 decimals)	(2 decimals)	(2 decimals)
dbh class (cm)	class basal area (m2)	class volume (m3)	plot size (ha)	expansion factor	tally	nrha (stems/ha)	basha (m2/ha)	volha (m3/ha)
10 --19	0.017	0.089	0.05	0.667	26	17.33	0.29	1.53
20-29	0.047	0.311	0.05	0.667	25	16.67	0.78	5.18
30-39	0.093	0.720	0.05	0.667	9	6.00	0.56	4.32
40-49	0.156	1.352	0.05	0.667	7	4.67	0.73	6.31
50-59	0.233	2.240	0.05	0.667	23	15.33	3.57	34.35
60-69	0.327	3.412	0.05	0.667	1	0.67	0.22	2.27
70-79	0.436	4.892	0.05	0.667	1	0.67	0.29	3.26
80-89	0.561	6.708	0.05	0.667		0.00	0.00	0.00
90-99	0.701	8.879	0.05	0.667		0.00	0.00	0.00
100-109	0.858	11.430	0.05	0.667		0.00	0.00	0.00
110-119	1.030	14.378	0.05	0.667	1	0.67	0.69	9.59
120-129	1.217	17.745	0.05	0.667	1	0.67	0.81	11.83
130-139	1.421	21.548	0.05	0.667		0.00	0.00	0.00
140-149	1.640	25.807	0.05	0.667		0.00	0.00	0.00
150-159	1.875	30.537	0.05	0.667		0.00	0.00	0.00
160-169	2.125	35.757	0.05	0.667		0.00	0.00	0.00
170-179	2.392	41.482	0.05	0.667		0.00	0.00	0.00
180-189	2.674	47.728	0.05	0.667		0.00	0.00	0.00
190-199	2.971	54.512	0.05	0.667		0.00	0.00	0.00
200-209			0.05	0.667				
							7.94	

Explanation:			
<i>col3</i>	: look up in volume table, for given species group and dbh class	: count, and fill in	
		: $col5 * col6$	
<i>col4</i>	: plot size for given dbh class	: $col7 * col2$	
<i>col5</i>	: $(1 / col4) / (\text{nr. of plots})$: $col7 * col3$	
(when rounding: round to the nearest EVEN digit; e.g. 0.635 to 0.64 but 0.665 to 0.66)			
(when rounding: round to the nearest EVEN digit; e.g. 0.635 to 0.64 but			

38. Annexure V: Compilation Sheet for Non-Timber Species for Norbuling CF

38.1.Compilation Sheet for Non-Timber Species (Barpakha Block)

OPERATIONAL INVENTORY: COMPILATION SHEET (FIXED-SIZE PLOT)								
1. CF Name	Norbuling			4. Block Area	36.59 Ha			
2.Block Name	Barpakha			5. Compiling date	04/10/2021			
3. No of plots	30			6. Species group	Broadleaf N-tree			
col1	col2	col3	col4	col5	col6	col7	col8	col9
		(3 decimals)	(3 decimals)	(3 decimals)	(0 decimals)	(2 decimals)	(2 decimals)	(2 decimals)
dbh class (cm)	class basal area (m2)	class volume (m3)	plot size (ha)	expansion factor	tally	nrha (stems/ha)	basha (m2/ha)	volha (m3/ha)
10 --19	0.017	0.0885	0.05	0.667	23	15.33	0.26	1.36
20-29	0.047	0.311	0.05	0.667	24	16.00	0.75	4.98
30-39	0.093	0.7195	0.05	0.667	16	10.67	0.99	7.67
40-49	0.156	1.352	0.05	0.667	16	10.67	1.66	14.42
50-59	0.233	2.24	0.05	0.667	1	0.67	0.16	1.49
60-69	0.327	3.4115	0.05	0.667	2	1.33	0.44	4.55
70-79	0.436	4.892	0.05	0.667	3	2.00	0.87	9.78
80-89	0.561	6.7075	0.05	0.667		0.00	0.00	0.00
90-99	0.701	8.879	0.05	0.667		0.00	0.00	0.00
100-109	0.858	11.4295	0.05	0.667		0.00	0.00	0.00
110-119	1.030	14.3775	0.05	0.667		0.00	0.00	0.00
120-129	1.217	17.7445	0.05	0.667		0.00	0.00	0.00
130-139	1.421	21.548	0.05	0.667		0.00	0.00	0.00
140-149	1.640	25.8065	0.05	0.667		0.00	0.00	0.00
150-159	1.875	30.537	0.05	0.667		0.00	0.00	0.00
160-169	2.125	35.757	0.05	0.667		0.00	0.00	0.00
170-179	2.392	41.482	0.05	0.667		0.00	0.00	0.00
180-189	2.674	47.728	0.05	0.667		0.00	0.00	0.00
190-199	2.971	54.5115	0.05	0.667				
200-209								

38.2.Compilation Sheet for Non-Timber Species (Hatipailay Block)

OPERATIONAL INVENTORY: COMPILATION SHEET (FIXED-SIZE PLOT)								
1. CF Name: Norbuling			4. Block Area: 28.91					
2. Block Name: Hati Pailay			5. Compiling date: 1/12/2021					
3. No of plots: 45			6. Species group			Broadleaf N-tree		
col1	col2	col3	col4	col5	col6	col7	col8	col9
		(3 decimals)	(3 decimals)	(3 decimals)	(0 decimals)	(2 decimals)	(2 decimals)	(2 decimals)
dbh class (cm)	class basal area (m2)	class volume (m3)	plot size (ha)	expansion factor	tally	nrha (stems/ha)	basha (m2/ha)	volha (m3/ha)
10 --19	0.017	0.0885	0.05	0.444	83	36.89	0.63	3.26
20-29	0.047	0.311	0.05	0.444	67	29.78	1.40	9.26
30-39	0.093	0.7195	0.05	0.444	42	18.67	1.74	13.43
40-49	0.156	1.352	0.05	0.444	14	6.22	0.97	8.41
50-59	0.233	2.24	0.05	0.444	26	11.56	2.69	25.88
60-69	0.327	3.4115	0.05	0.444	1	0.44	0.15	1.52
70-79	0.436	4.892	0.05	0.444	0	0.00	0.00	0.00
80-89	0.561	6.7075	0.05	0.444	0	0.00	0.00	0.00
90-99	0.701	8.879	0.05	0.444	1	0.44	0.31	3.95
100-109	0.858	11.4295	0.05	0.444		0.00	0.00	0.00
110-119	1.030	14.3775	0.05	0.444		0.00	0.00	0.00
120-129	1.217	17.7445	0.05	0.444		0.00	0.00	0.00
130-139	1.421	21.548	0.05	0.444		0.00	0.00	0.00
140-149	1.640	25.8065	0.05	0.444		0.00	0.00	0.00
150-159	1.875	30.537	0.05	0.444		0.00	0.00	0.00
160-169	2.125	35.757	0.05	0.444		0.00	0.00	0.00
170-179	2.392	41.482	0.05	0.444		0.00	0.00	0.00
180-189	2.674	47.728	0.05	0.444		0.00	0.00	0.00
190-199	2.971	54.5115	0.05	0.444				
200-209								