



**CONSERVATION MANAGEMENT PLAN
OF SAKTENG WILDLIFE SANCTUARY**
(Amendment, 2019)



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ROYAL GOVERNMENT OF BHUTAN
MINISTRY OF AGRICULTURE & FORESTS
DEPARTMENT OF FORESTS & PARK SERVICES
SAKTENG WILDLIFE SANCTUARY



CONSERVATION MANAGEMENT PLAN OF SAKTENG WILDLIFE SANCTUARY (AMENDMENT, 2019)

Prepared By:

Kesang Dorjee, Sr. Forest Ranger, SWS, DoFPS
Kumbu Dorji, Sr. Forestry Officer, SWS, DoFPS
Sonam Tobgay, Sr. Forestry Officer, SWS, DoFPS
Norbu Yangdon, Forestry Officer, SWS, DoFPS
Sonam Wangyel, Forestry Officer, SWS, DoFPS

Critical Input and Edited by:

Thinley Wangdi, Chief Forestry Officer, Samtse Territorial Division, DoFPS

Important Contributors (additional data, information and editing):

Jangchu Wangdi FO; Dorji, Sr. FR I; Pema Rinzin Sr. FR II; Sangay Chophel, FR I; Dorji, Sr. FR I; Rinchen Khandu, FR I & Jambay Dhendrup, Sr. FR III.

Survey team members:

Norbu Yangdon, FO; Kesang Dorjee, Sr. FR I; Sonam Tobgay, Sr. FO; Kumbu Dorji, Sr. FO; Sonam Wangyel, FO; Jangchu Wangdi FO; Pema Rinzin, Sr. FR II; Sangay Chophel, FR I; Dorji, Sr. FR I; Tenzin Lhendup, Sr. FR II; Jambay Dhendrup, Sr. FR III; Pema Geyltshen, FR II; Tenzin Cheda, FR II; Rinchen Khandu, FR I; Tenzin Nima, Sr. Fr; Late Phurpa Dorji, Fr; Sonam Jamtsho, Sr. Fr; Ugyen Wangchuk, FR II; Samten Choden, Fr; Jamtsho, Sr. Fr; Pema Tshewang, Sr. Fr; Ngawang Choizom, Sr. Fr & Ghana Shyam Bhandari, Sr. Fr.

Logistic support: Tshering Norbu, Tenzin Norbu, Tashi Phuntsho, Sangay Ledda, Kezang Norbu, Kinley Dorji, Lhendup Pema Chhpjay, Kinzang Yeshe & Kinzang Wangdi

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Endorsement and Approval of the Royal Government of Bhutan

Conservation Management Plan of Sakteng Wildlife Sanctuary (Amendment, 2019)

“In accordance to the provision under Section 21 subsection (b) of the Forest and Nature Conservation Act of Bhutan, 1995”

Submitted for Approval:

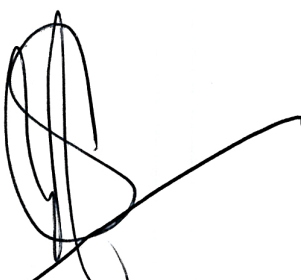


Chief Forestry Officer
Sakteng Wildlife Sanctuary

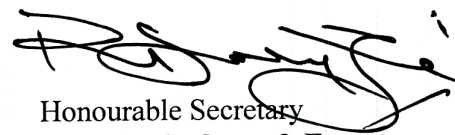


Chief Forestry Officer
Nature Conservation Division

Recommended for Approval:



Honourable Director
Department of Forests & Park Services



Honourable Secretary
Ministry of Agriculture & Forests

Approved by:



His Excellency the Minister
Ministry of Agriculture & Forests

PREFACE

Conservation of the environment is one of the four pillars of Bhutan's Gross National Happiness philosophy. Due to our visionary monarchs and their stewardship in environmental preservation, Bhutan has received several prestigious global environmental awards such as Paul Getty Award for Conservation Leadership, UNEP "Champion of Earth" and the Kyoto Earth Hall of Fame. The conservation of our forest is mandated in the country's constitution whereby we have to preserve 60 percent of our land under forest cover for all times to come.


In Bhutan, we have a unique system of protected area (PA) management where there is a co-existence of human and wildlife at the same place. This provides a great challenge for the managers. The needs of the people should be met from the PA and as a result there is a huge pressure on natural resources like timber and other non-wood forest products (NWFPs).

Currently, Bhutan has 71 % of land under forest cover having the rich number of flora and fauna. In our mandate for meeting the conservation goals and at the same time fulfilling the local and commercial needs, Department of Forests and Park Services is faced with many challenges.

Sakteng Wildlife Sanctuary located in the Eastern part of the country is one of the ten PAs in Bhutan which has rich ecosystem diversity and serve as a home to nearly 5000 semi-nomads who depends on livestock rearing as a source of livelihood. The need of the local people like timber and other natural resources are all catered from the Sanctuary. It is felt that the present rate of population growth, urbanization and other necessary developmental activities are posing a greater challenge in ensuring the sustainability of forest resources and habitat management. Thus, it is important to draw a plan which can help to execute the habitat management and sustainable forest management in the PA.

I am delighted that Sakteng Wildlife Sanctuary has come up with the Conservation Management Plan (Amendment, 2019) at a right time by incorporating all the needful prescriptions required for the sound management of the PA. Therefore, I would like to congratulate and wish you all the best in successful implementation of the plan.

TASHI DELEK!



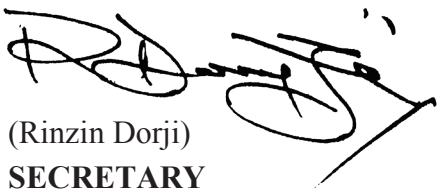
(Yeshey Penjor)
MINISTER
Ministry of Agriculture and Forests

FOREWORD

Bhutan today has, more than 50 % of its area under the protected area networks. There are 10 protected areas in the country which represents intricate and unique ecological processes having the potential capacity to provide human needs at the same time protecting the environmental values. The country has rich biodiversity and serves as an abode to several iconic species of wild animals and plants, thus making the country recognized as one of the ten global hotspots. Understanding the significance of protected areas and future needs, forests should be managed in such a way that helps to uphold their multiple values. For this, the conservation management plan is a crucial tool to ensure the overall management of the protected area. This includes the management of wildlife habitat, natural resources and the service delivery to the community residing in and around the protected area.

Recognizing the conservation significance and new challenges at local as well as national level, I am happy to know that Sakteng Wildlife Sanctuary has come up with the Conservation Management Plan (Amendment, 2019). It is heartening to notice that the new plan has a clear vision and goal with realistic, assessable, and time-bound objectives that are all geared towards accomplishing the goal of preserving the rich biodiversity and providing the ecosystem services to the nation. Further, the national goal of maintaining 60 percent of forest cover is evidently visible in this document.

I would like to congratulate the entire staff of Sakteng Wildlife Sanctuary for doing this commendable work and I am confident that the plan will be fully implemented within the stipulated time frame. I would also like to take the opportunity to thank Bhutan Trust Fund for Environmental Conservation (BT FEC) for their generous financial support provided to develop this plan.



(Rinzin Dorji)

SECRETARY

Ministry of Agriculture and Forests

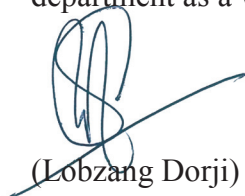
FOREWORD

Forests in Bhutan play a vital role in the socio economic development of the country besides providing regulatory services such as watershed protection, prevention of soil erosion and climate mitigation. Further, deforestation and forest degradation is acknowledged as one of the main causes of climate change acceleration. Recognizing this urgency and also to ensure the constitutional mandate of 60% forest cover for perpetuity, the Department of Forests and Park Services have declared large area of forest landscapes as protected areas.

Sakteng Wildlife Sanctuary with high ecological diversity and unique cultural heritage of the *Brokpa* community is a important protected area not only for the conservation of the floral and faunal species but also for the promotion of the unique cultural heritage of the *Brokpa* community. For successful management of such ecological landscapes, a dynamic and robust management plan developed through adequate understanding of field situation is of paramount importance. This plan provides concise information on the floral and faunal diversity of SWS, the issues and challenges faced by the management team and most importantly the management prescriptions recommended to solve the emerging issues in the Sanctuary.

While the sustainable management of forest, based on the scientific principles has been mostly focused in the forest management units (FMUs) in territorial division, the forest area outside FMUs like protected areas are under huge pressure. Therefore, it has become important for all of us to balance between conservation and utilization of the natural resources which can be achieved through the holistic plan in place. Understanding the importance of managing these areas, Department of Forests and Park Services has recognized the “management of forest areas outside the FMUs” as one of the important step for the sustainable management of our forest. I am delighted that Sakteng Wildlife Sanctuary (SWS) has come up with the amendment in Conservation Management Plan by including the sustainable timber harvesting plan for the Sanctuary.

I congratulate and express my appreciation to SWS for their hard work and dedication on conservation efforts. I am confident that this plan will not only help to mainstream the conservation effort but also act as a guiding force towards achieving the goals of the department as a whole.



(Lobzang Dorji)

DIRECTOR

Department of Forests and Park Services

ACKNOWLEDGEMENT

Sakteng Wildlife Sanctuary (SWS) would like to express deepest appreciation to all the staffs and institutes who have contributed towards making this plan a successful one.

SWS would like to thank Forest Resources Management Division (FRMD) and Nature Conservation Division (NCD) under Department of Forests and Park services for rendering their support in developing this plan. We are thankful to Mr. Thinley Wangdi, Chief Forestry Officer, Samtse Division for his important inputs in this document. Furthermore, we would like to acknowledge Research and Development Centre (RDC) at Yusipang for lending the necessary equipment during the field survey. We are grateful to Asst. Professor, Karma Wangchuck, at Sherubtse College for his valuable contribution in the plan. We also remain highly indebted to Trashigang Division and Gewog Administration of Merak and Sakteng for providing their feedbacks and inputs in the plan.

Lastly, we would like to extend our heartfelt gratitude to Bhutan Trust Fund for Environmental Conservation (BTFEC) for their generous financial support in developing this document which will contribute in preserving the rich biodiversity of our country.

Management of Sakteng Wildlife Sanctuary, 2019

List of Acronyms

AAC silv.	Annual Allowable Cut Silvicultural
AAC sust.	Annual Allowable Cut Sustainable
ABSD	Accelerating Bhutan's Socio-economic Development
B2C2	Bhutan Biological Conservation Complex
BHU	Basic Health Unit
BT FEC	Bhutan Trust Fund For Environmental Conservation
CF	Community Forest
CGI	Corrugated Galvanised Iron
Dbh	Diameter at Breast Height
DoFPS	Department of Forest and Park Services
FMA	Forest Management Area
FMU	Forest Management Unit
FNCA	Forest and Nature Conservation Act
FNCRR	Forest and Nature Conservation Rules and Regulations of Bhutan
FRMD	Forest Resources Management Division
GIS	Geographic Information System
GRF	Government Reserved Forest
Ha	Hectare
HC	Hardwood Conifer
HH	Household(s)
IFAD	International Fund for Agricultural Development
IUCN	International Union for Conservation of Nature
IVI	Important value index
Km	Kilo-meter
Km ²	Kilo-meter Square
LULC	Land Use and Land Cover
m ²	Meter Square
m ³	Meter Cubic
MAGIP	Marketing Access and Growth Intensification Project
MAP(s)	Medicinal and Aromatic Plants

masl	Meter Above Sea Level
METT	Management Effectiveness Tracking Tool
NWFP	Non-Wood Forest Product
PA	Protected Area
PRA	Participatory Rural Appraisal
RGoB	Royal Government of Bhutan
sp/spp	Species/Plural of species
SWS	Sakteng Wildlife Sanctuary
WCPA	World Congress on Protected Areas
WWF	World Wildlife Fund

Glossary

A	abundant occurrence of NWFP
Aum Jomo	local deity
Bas. Area (m ² /ha)	basal area per ha of the sub-compartment
Brokpa(s)	local inhabitants of Merak and Sakteng Gewog
Cham	trees (girth 3' to 3'11")
Drashing	trees (girth 4'1" & above)
Dungkhag	subdivision of district
Dzong	fortress
Dzongkhag	district
Dzo	male crossbreed of yak & cattle
Dzom	female crossbreed of yak & cattle
E	extensive forest use
Gewog	block or administrative unit below district level
Gomchen	buddhist scholar/monk
Gung no.	house no.
Height 0,3<1.3m	number of trees of this height class
I	intensive forest use
Khimsa	land for dwelling house

Lhakhang	temple
N/ha	number of trees per ha
Ntotal	total number of trees of the sub-compartment
Ri/chhu	river
S	sparse occurrence of NWFP
Tsamdro	pastureland
Tsim	trees (girth 1' to 2')
Volume (m ³ /ha)	standing volume per ha of the sub-compartment
Volume conifer %	percentage of conifers in relation to the standing volume

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Executive Summary

Sakteng Wildlife Sanctuary (SWS) is one of the ten protected areas declared by the Royal Government of Bhutan under the farsighted leadership of His Majesty the fourth Druk Gyalpo Jigme Singye Wangchuck. With an assemblage of rich ecosystem diversity and distinctive culture, it is home to some of the rarest and globally threatened wild flora and fauna. The area is adorned with diverse ecosystem ranging from warm broadleaved forests to alpine meadows. SWS is the only protected area with highest diversity of *Rhododendron* species (41 species) in the country. To protect and conserve this diverse assemblage of biodiversity and unique cultural heritage, SWS was operationalized in 2003 with financial support from RGoB and WWF. In 2013, the Sanctuary was proposed to be designated as one of the four PAs to be included under World Heritage site.

Located in easternmost part of the country, it has an area of 740.60 km² encompassing Merak and Sakteng Gewogs under Trashigang Dzongkhag and a part of Lauri Gewog under Samdrup Jongkhar Dzongkhag. SWS has also submitted the proposal to increase its area and management is expecting the total area of 938.02 km² in near future. The Sanctuary also shares border with the Indian State of Arunachal Pradesh in the East and North. For promoting a healthy faunal population, the Sanctuary is well connected by biological corridor to Jomotshangkha Wildlife Sanctuary forming a part of the Bhutan Biological Conservation Complex (B2C2).

The Sanctuary can be categorized into three climatic zones – subtropical, temperate and alpine zone. Major part of the Sanctuary area falls under temperate zone characterized by cold winter and warm summer. Highest rainfall occurs in the months of June to August and snowfall starts from October to April. Three river systems– Gam-ri, Mera-ama-ri and Jomo-ri originate from the Sanctuary.

The first management plan for Sakteng Wildlife Sanctuary (2008-2013) was prepared based on the rapid biodiversity assessment conducted along major trekking routes and few accessible trails. Because of the limited field survey, the biodiversity was tremendously under-represented and consequently recommended for total biodiversity assessment of the area. Consequently, the major emphasis of the first management plan for SWS (2008-2013) was focused on restoration of wildlife species, providing alternative to timber resources, enhancement of income generation opportunities, zoning of area, capacity building of staff and development of infrastructures.

The current conservation management plan is prepared based on findings of robust assessment of the biodiversity and socio-economic survey done by competent Sanctuary staff. In addition, a strategic framework analysis and several participatory appraisals, stakeholder consultation at local, regional and national level have contributed to dynamic plan document.

For the first time in the history of protected area management in Bhutan, conservation management plan for SWS covers ten year period from July 2017 to June 2027. The plan is now amended by including a section on sustainable timber harvesting plan which also covers

a period of ten years effective from July 2019 to June 2029. Cost for biodiversity and socio-economic survey for producing and publication of this conservation management plan was funded by the BTFEC. The RGoB had supported staff remuneration and operational cost of the SWS management.

A total of 858 plants, 39 mammals, 283 birds, 63 butterflies, 5 reptiles, 3 amphibians, and 2 fish species were recorded from the biodiversity assessment conducted in 105 plots covering the entire area of the Sanctuary. SWS also have thriving population of Takins which were introduced from Jigme Dorji National Park and Bhutan Takin Preserve.

The Sanctuary is home to about 5000 semi-nomads (*Brokpa*) of Merak and Sakteng largely dependent on livestock rearing as a source of livelihood sustenance. Eighty-five percent of the household income is generated from the livestock husbandry. Of 772 households (HH) in 13 villages under Merak and Sakteng Gewog, 85% (567 HH) depends on livestock farming. Very few people living in the lower areas (below 2500m altitude) depend on subsistence farming. Owing to the transhumance practice of the *Brokpa* community dependency on the natural resources is immense.

Socio-economic study result indicates that major problems and issues faced by the local community are insufficient *Tsamdro* (pasture land), livestock and crop depredation, loss of culture and tradition, and degradation of pasture land and water resources. Similarly, biodiversity assessment result reveals habitat fragmentation and species loss caused by excessive livestock grazing, overexploitation of natural resources, poaching, developmental activities (road and transmission lines), and dependency of local people on natural resources are major sources of threat to the biodiversity conservation in the Sanctuary.

To realize the set vision and overall goal, SWS management have proposed a set of objectives and strategic actions that shall address both social and biodiversity issues. Priority objective of the plan period is to provide maximum protection to representative ecosystems through implementation of strategic conservation programs, building local economy without compromising age old culture and traditions.

Total fund projection for plan period (10 year) is Nu. 496.96 million (four hundred ninety six million nine hundred sixty thousand). Of the total projected fund, 48.21% is recurrent expenses and 51.79% for capital financing. The recurrent expenditure is expected to meet from RGoB contribution and the remaining financial gap of 51.79% will be required to source from potential donors.

The conservation management plan is amended by incorporating a sustainable timber harvesting plan (2019-2029) because the sustainable timber harvesting in Bhutan is mostly practiced in forest management units (FMUs) and community forest (CF). The resource allocation outside the FMUs (protected areas, biological corridor and other state reserved forest) are driven by the demand without much consideration to the scientific principle of sustainability.

The upsurge of developmental activities and increased timber demand has increased the pressure on timber resources in SWS. This has led to the deforestation and fragmentation of the habitat for most of the wildlife including few endangered species. Therefore, sustainable timber harvesting plan has become urgently necessary for SWS. With the aim to ease the sustainable harvesting of the timber, the annual allowable cut (AAC) was determined for all ranges namely, Merak, Sakteng and Joenkhar. The data were collected from 1863 plots from 119 sub-compartments (size 10-100 ha) under 26 compartments (size 200-1000 ha). The findings shows that Sakteng range had the largest forest management area with 4335.3 ha followed by Merak with 3333.8 ha and Joenkhar with 3239.5 ha. The AAC was highest for Merak with 6121 m³ followed by 5737 m³ for Sakteng and least for Joenkhar with 2449 m³. While assessing the demand and supply, Merak range was short of all timber products like *drashing*, *cham*, *tsim* and pole due to higher annual timber demand. The annual timber supply was comfortable for Sakteng and Joenkhar ranges as compared to Merak. For the firewood, all ranges are able to meet the demand for the plan period of 10 years. The range with insufficient timber supply should be supplemented from the surplus stock of other ranges. The timber allotment record (2004-2018) indicated that majority of the timber demand were from the Gewogs outside SWS jurisdiction. Thus, a collaborative effort is required with the nearby territorial division to address the issue and find the alternative measures. The priority for the timber allotment should be given first to the local people residing inside SWS followed by the residents outside the Sanctuary as per the AAC of the respective ranges.

PART I

CONSERVATION MANAGEMENT PLAN (2017-2027)

Chapter 1: Introduction

The Royal Government of Bhutan (RGoB) places enormous emphasis on conserving the country's biological resources through establishment of protected area (PA) networks and biological corridors. Around 51.44% of the country's geographical area has been set aside under the PA and biological corridors to allow free movement of various wildlife species thus assuring their viability. The revision of the PA system in Bhutan was done in 1993 to ensure representation of the different ecosystems of the country; it currently comprises of five national parks, four wildlife sanctuaries, and one strict nature reserve.

Sakteng Wildlife Sanctuary (SWS) was established in 2003 to represent the easternmost temperate and alpine ecosystems of Bhutan. It is home to some of the rarest and globally threatened wildlife species and harbours the maximum number of *Rhododendron* species with 41 species out of 46 *Rhododendron* species recorded in the country (Pradhan, 1999). "Brokpas" the semi-nomadic highlanders with unique culture and traditions are the inhabitants of the Sanctuary. The PAs of Bhutan are unique from rest of the world due to the presence of settlements which makes the conservation task complex and challenging. Consequently, the Bhutan's PAs management approach needs to be comprehensive, embracing many disciplines. Further, the Forest and Nature Conservation Act (FNCA) 1995 of Bhutan mandates to manage PAs of the country with prescribed scientific management plans.

The Department of Forests and Park Services (DoFPS) is one of the oldest departments of Bhutan established in the year 1952. The management of PAs in Bhutan was initiated only after the enactment of National Forest Policy in 1974 and notification of National Parks and Wildlife Sanctuaries in 1979. However, majority of the Bhutan's PAs were operationalized from the early nineties. The conservation management plans in the past were mostly prepared by external experts and the trend still prevails in some PAs.

The first five year management plan (2008-2013) for SWS was based on the biodiversity data collected along major trails and livestock migratory routes. Hence, the biodiversity of the Sanctuary was underrepresented. The present plan is based on biodiversity data collected from 105 terrestrial and 30 freshwater plots inclusive of total forest types covering entire area of the Sanctuary. Additionally, social information was collected using the Participatory Rural Appraisal (PRA) tool through an interactive workshop involving total of 772 households (HHs) of the Sanctuary. Individual HH data were collected from 173 representatives HHs using a structured questionnaire.

The present conservation management plan is initiated and prepared by the staff of SWS with generous funding support from Bhutan Trust Fund for Environmental Conservation (BT FEC) and can be pronounced as "by the people for the people". This management plan shall serve as a tool to source funds to implement the management plan prescriptions to promote harmonious co-existence of nature and local community. It will also provide PA manager optimum strength

to bargain with policy makers on core issues of conservation and gain general public empathy towards biodiversity conservation and its dynamics.

1.1 Description

1.1.1 Global Significance

SWS represents an eastern Himalayan temperate ecosystem which harbours a number of globally threatened and endangered species like the Royal Bengal Tiger (*Panthera tigris*), Red Panda (*Ailurus fulgens*), Musk Deer (*Moschus* sp.) Capped Langur (*Trachypithecus pileatu*), Himalayan Black Bear (*Ursus thibetanus laniger*), and Himalayan Serow (*Capricornis thar*) to name a few. Home to diverse flora and fauna, it has a number of outstanding universal values that qualifies SWS as a mixed World Heritage Site and has made to the tentative list of UNESCO world heritage site in 2013.

The area exhibits unique cultural traditions, an outstanding example of a traditional human settlement and land-use, natural beauty, aesthetic value and the most important and significant natural habitats for in-situ conservation of biological diversity from the science and conservation point of view.

1.1.2 National Significance

SWS is designated to protect the easternmost temperate ecosystem of Bhutan. It also forms the head waters of major river systems of the country for production of clean hydro power energy for increased revenue generation. SWS contribute towards achieving the philosophy of Gross National Happiness (GNH) by strongly promoting Environmental Conservation and Preservation and Promotion of Culture. The Sanctuary offers opportunity of upholding the constitutional mandate of maintaining 60% forest cover for all times and realizing the Bhutan's commitment of remaining carbon neutral.

1.1.3 Local Significance

SWS is home to the highest diversity of *Rhododendron* with 41 species out of 46 recorded in the country. SWS is at the head water source of Gam-ri watershed which benefits lower valleys of Phongmey, Radhi, Shongphu, Samkhar, Bidung and Bartsam Gewogs (cluster of villages under one local administrative unit) under Trashigang Dzongkhag. The Sanctuary has numerous streams and alpine lakes feeding a constant supply of water into the downstream rivers. It provides livelihood sustenance to closely 5000 semi-nomads depending on livestock farming as a source of economic mainstay.

Culturally, the Brokpa tradition is unique not only to Bhutan but also to the world and it calls for greater attention for preservation as economic development and modernization enter into remote corners of the country.

1.2 Biophysical Characteristics

1.2.1 Location

SWS is located in between the latitudes; 27°09'00" - 27°28'08" North and longitudes; 91°47'04" - 92°07'02" East covering an area of 740.60km². It borders with the Indian State of Arunachal Pradesh in north and east, Phongmey Gewog under Trashigang Dzongkhag in the west and Lauri Gewog, Samdrup Jongkhar in south. The Sanctuary is connected to Jomotshangkha Wildlife Sanctuary by a biological corridor in the south forming a part of Bhutan Biological Conservation Complex (B2C2).

Officially SWS cover about 85.2 % of Sakteng, 67.3% of Merak Gewog and 9.4% of Lauri Gewog (Figure 1). However, for faster public service delivery and to save administrative cost, SWS management provides forestry services to the remaining villages falling outside the Sanctuary area viz. Sheytami, Drana and Chipling areas (seasonal grazing area of Merak Gewog) and Joenkhar, Bumlock, Murbee and Yongbazor under Sakteng Gewog. In reality the SWS manages the entire Gewogs of Merak, Sakteng, and a part of Lauri covering a total of 938.02 Km². Therefore, the proposal to increase the total area has been submitted to the Department for approval.

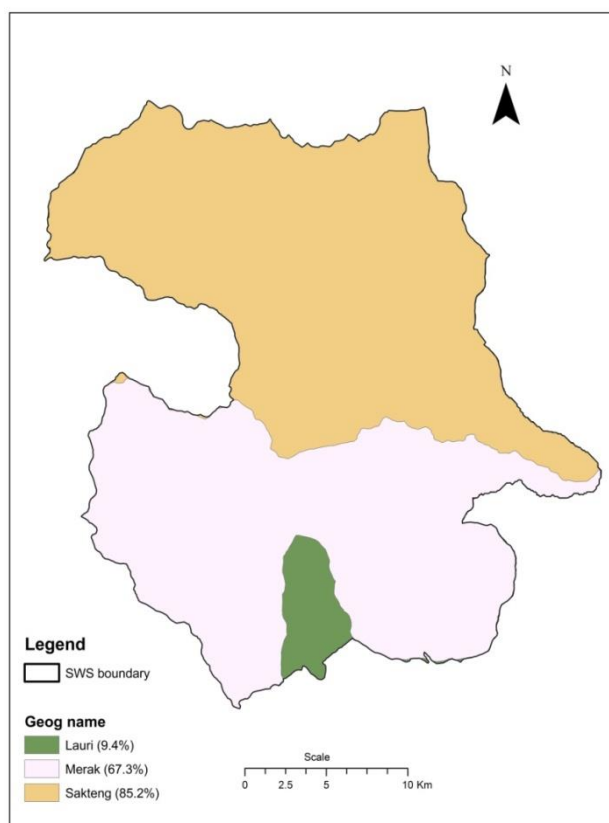


Figure 1: Administrative Map of SWS

1.2.2 Climate and Topography

Broadly SWS can be categorized into three climatic zones; subtropical, temperate, and alpine meadows. Altitude ranges from 1500-4500 m with sub-tropical climate in the low-lying valleys to alpine meadows in the higher mountains. The majority of the SWS fall under temperate zone. The temperate climatic condition is characterized by cold winters and warm summers with occasional heavy rainfall. Area receives highest rainfall during the month of June, July and August with sporadic rainfall throughout late April to early October, especially during late afternoon (Figure 2). Snowfall occurs from mid-October till early April.

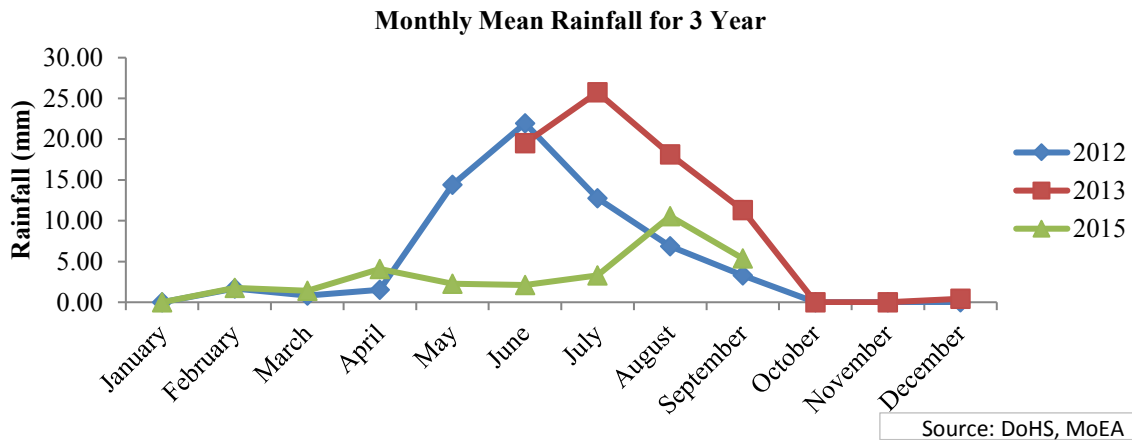


Figure 2: Rainfall trend of Sakteng Wildlife Sanctuary

Geologically, the Sanctuary is Tethyan meta-sediments and surface drift comprise of Periglacial, Aeolian and Colluvium on slopes with substantial alluvium in high valley (WII, 2005). The upper part of SWS is wide with gentle slopes and scree, harbouring numerous alpine lakes. The lower parts are scoured steeply by streams and rivers forming narrow valleys.

Merak and Gyengu villages under Merak Gewog and Pussa, Tengma, Manirong, Sakteng, Borangmang and Borangtse under Sakteng Gewog are located in the mid valley. Thrakthri, Dak, Murbee and Kheliphu are situated in the lower hill slope. Joenkhar, Tholong, Shingkar and Khashiteng are located on lower valley.

1.2.3 Hydrology and Drainage

SWS can be divided into five sub-watersheds of Eastern Bhutan (Figure 3). Amongst which Gam-ri watershed comprise of 39.2% of total area followed by Yachu (19.4 %), Shaar-chhu (18.9%), Jomo-ri (15.1%) and smallest being Mera-ama-ri (7.4%).

Three major rivers of SWS– Gam-ri, Mera-ama-ri and Jomo-ri are fed by numerous small and medium size lake, streams and seasonal rain/snow. There are no permanent snow-capped mountains in SWS. Gam-ri originates from the extreme North-eastern part bordering India at Jang-Puensum (three brothers) and Dremaling Lake joined by numerous small streams. Bamukpa-ri is the major tributary of Gam-ri originating from Tsho-na, Tshetzung area.

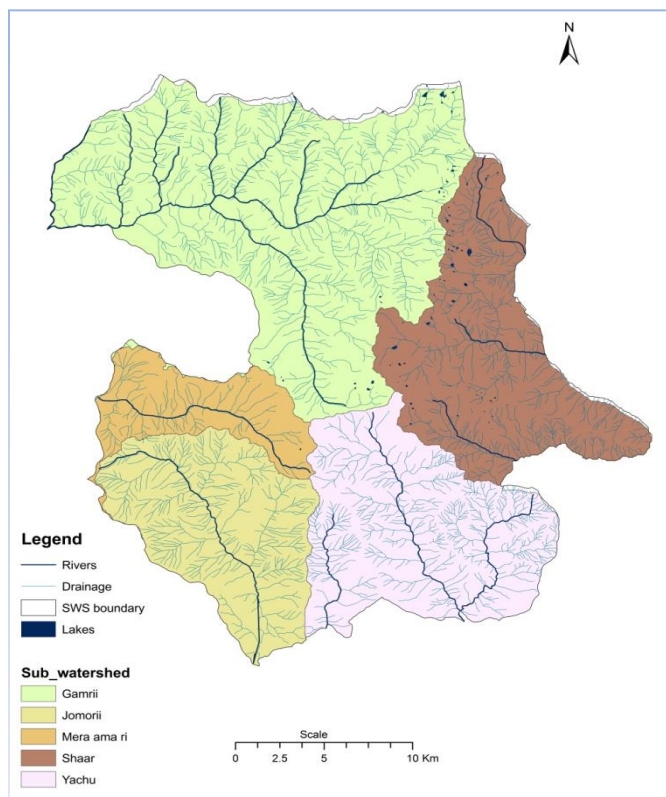


Figure 3: SWS Watershed Map

Mera-ama-ri originates from Kayakpa, Northern flank of Mount Yanglay-Yangchung. Gam-ri meets Drangme-Chhu below Trashigang Dzong (Chhazam) and Mera-ama-ri joins Bara-Nadhi (river) in India. The Jomo-ri originates from Serkemla and Mount Jomo Kungkhar joined by numbers of small and big streams. Taktakpa-ri originates from Mount Yanglay-Yangchung flowing through Taktakpa village, Gerku-ri and Kheliphu-ri flowing through Kheliphu village joins Jomo-ri at Jompa village in Lauri under Samdrup Jongkhar.

Based on the preliminary study, 104 lakes of different sizes were recorded within the Sanctuary and it feeds to about fourteen small rivers from its catchment area forming important tributaries of some of the major river system like Mera-ama-ri and Drangme-chhu in the East (SWS, 2010). Of the total lakes, more than 90% of the lakes are located in alpine areas.

1.2.4 Vegetation Types

Based on the frequency and crop density of forest, Adhikari, (2005) determined 10 forest types at 50% similarity threshold through a computer program TWINSpan (Two-way Indicator Species Analysis);

1. Conifer-broadleaved
2. Riverine
3. Mixed Broadleaved
4. Broadleaved-deciduous
5. Broadleaved-conifer
6. Broadleaved-evergreen
7. Fir/mixed-coniferous
8. Juniper
9. Mixed
10. Coniferous

However, with recent biodiversity survey 2015, the forest was reclassified into eight forest types based on classification system of National Forest Inventory of Bhutan, 2012 as follows:

1. Dry Alpine Scrub
2. Rhododendron scrub
3. Fir Forest
4. Hemlock Forest
5. Cool Broadleaved Forest
6. Bhutan Pine Forest
7. Chir Pine Forest
8. Warm Broadleaved Forest

1. Dry Alpine Scrub:

Dry Alpine Scrub starts beyond 4000m altitude with a diversity of flowering plants such as *Rhododendron setosum*, *R. anthopogon*, *R. bhutanense*, *Primula* spp., *Potentilla* spp., *Gentiana* spp., *Rheum* spp., *Meconopsis* spp. and *Rhodiola* spp. The area harbours numerous alpine lakes

that support streams and rivers downhill. The highest altitude of Sanctuary area is 4500m measured only on a few mountain peaks.

2. Rhododendron Scrub:

Such kinds of forest types are anthropogenic in origin and spreads sporadically from 3100-4200m altitude. This forest appeared due to the clearance of large tracks of pristine conifer forest in the past by herders to create open grazing ground and subsequently unpalatable shrub like Rhododendron and Juniper invaded the areas.

3. Fir Forest:

Old growths of Fir forest are found from 2800-4100m altitude mostly on Southern aspects. In Northern aspects and deep valleys associate species like *Betula utilis*, *Rhododendron hodgsonii*, *R. kesangiae*, and *R. falconeri* occupy the area.

4. Hemlock Forest:

Being a shade bearer in its initial stage, Hemlock forests are mostly found on the north facing slopes from 2500-3500m altitude. In higher elevations, Hemlock forest is associated with *Abies densa*, *Betula utilis*, *B. alnoides*, *Hydrangea* spp., *Rhododendron arboreum*, *Magnolia* spp., *Taxus baccata*, *Borinda grossa* and *Alnus nepalensis* in mid and lower altitude. *Quercus semecarpifolia* was concentrated on South facing slopes along Gam-ri in Sakteng valley.

5. Cool Broadleaved Forest:

Cool broadleaved forest is interspersed with Hemlock and Bhutan Pine forest from 2200-3000m. This forest is dominated by *Acer* spp., *Betula* spp., *Rhododendron* spp., *Quercus* spp., *Sorbus* spp., *Salix* spp., *Hydrangea* spp., *Viburnum* spp., *Lyonia* sp., *Magnolia* spp., *Castanopsis* spp. and *Schima* spp. with profuse growth of *Borinda grossa*.

6. Bhutan Pine Forest:

Matured stands of Bhutan pine forest occur at the altitude range from 1800-3000m. Being a light demanding species, patches of *Pinus bhutanica* was found mostly on exposed and south facing slopes. *Quercus lanata*, *Lyonia* spp., *Rhododendron arboreum* and *Schima* spp. were main associates in Bhutan pine forest.

7. Chir Pine Forest:

Chir pine forest was concentrated from 1500- 2500m altitude on hot and dryer slopes. *Quercus griffithii*, *Q. lanata*, *Lyonia* spp., *Rhododendron arboreum*, *Schima* spp. were main associates in Chir pine forest. After exclusion of fire since establishment of SWS in 2003, broadleaved species are growing profusely in this forest and new recruits of *Pinus roxburghii* is almost lacking.

8. Warm Broadleaved Forest:

This type of forest occurs at the altitude range from 1500-2000m in the pockets of dryer mountain valleys. *Lithocarpus elegans*, *Schima wallichii*, *Juglans regia*, *Michelia champaca*, *Quercus griffithii*, *Q.lanata* were dominant species in this forest.

1.2.5 Floral Diversity

A total of 858 plant species with 141 families under 35 orders were recorded from the terrestrial biodiversity survey (Annexure 1). Out of this 57% were herbs (including climbers), 17% trees, 14% shrubs and 12% orchids. About 65% of SWS is dominated by coniferous forest comprised of 12 species of conifer under seven genera viz. Fir (*Abies densa*), Hemlock (*Tsuga dumosa*), Larch (*Larix griffithii*), Himalayan Yew (*Taxus* sp.) Bhutan pine (*Pinus bhutanica*), Chir pine (*Pinus roxburghii*) and Spruce (*Picea spinulosa*), and five species of Juniper (*Juniperus recurva*, *J. communis*, *J.cf.indica*, *J.squamata* and *J. pseudosabina*).

Fir is the most dominant conifer species followed by Hemlock and Juniper with Important Value Index (IVI) 78.07, 34.51 and 12.63 respectively. Larch is mostly concentrated along stream/river beds and landslide areas above 2500m altitude. *Rhododendron* (20 species of shrub/tree) has the highest encounter rate with 70.03 IVI, forming undergrowth storey of the conifer forest (Annexure 2). Few isolated *Taxus baccata* are found in mixed conifer forest. Countable *Picea spinulosa* were recorded around Pussa village in Sakteng valley making it locally endangered and needs immediate management intervention. Sporadic stands of matured *Pinus bhutanica* was found around Joenkhar, Tholong, Dak, Thrakthriand few immature trees in Sakteng, Drana and Shingkhar. Small patches of *Pinus roxburghii* was found in Gelongphukpa core zone only.

Broadleaved forest covers 19% of the Sanctuary consisting of *Acer campbellii*, *Betula utilis* and *B. alnoides* with IVI 10.13, 6.35 and 4.56 respectively. Scattered growth of *Sorbus* spp., *Hydrangea* spp., *Salix* spp., *Swida* spp., *Enkianthus* spp. and *Viburnum* spp. with IVI <3 were also found in this area. *Quercus semecarpifolia* (IVI 2.17) is confined along Gam-ri bank is the most preferred firewood species in Sakteng valley and requires special conservation efforts.

As an adaptation (disturbance and harsh climatic condition) mechanism, some of the tree species restricted their development into shrubs viz. *Rhododendron*, *Salix*, *Viburnum*, *Lyonia*, *Hydrangea*, *Sorbus* and *Juniperus*. In higher altitudes (above 3800m) the shrub layer is dominated by *krummholz* (growth form of tree under great environmental stress) of *Rhododendron* spp. and *Juniperus* spp. along with scanty growth of *Juncus*, *Geranium*, *Gentiana*, *Bistorta*, *Rheum*, *Primula*, *Fragaria* and grasses (*Poa* sp). At 3000-3800m altitude range, the area is covered by shrubs like *Rhododendron*, *Rosa*, *Daphne*, Bamboo, *Rubus*, *Salix*, *Viburnum*, *Sorbus*, *Hydrangea* etc. along with luxuriant growth of *Aconogonon*, *Primula*, *Potentilla*, *Anaphalis*, *Epolobium*, *Saussurea*, *Persicaria* and *Geranium*. Majority of the settlements in SWS falls within this altitude exerting tremendous pressure on the natural resources.

In mid altitude range between 2200-3000m; *Rosa*, *Vaccinium*, *Daphne*, Bamboo, *Rhododendron*, *Berberis*, *Elsholtzia*, *Salix*, *Hydrangea* and *Ribes* forms the dominant shrub layer. *Gnaphalium*, *Carex*, *Rubus*, *Pteridium*, *Bidens*, *Fragaria*, *Rumex*, *Ageratina*, *Hypericum* etc. constitutes the ground cover. Below 2200m, the main species of shrubs are *Desmodium*, *Daphne*, *Oxyspora*, *Rubus*, *Dichroa*, *Hypericum*, *Viburnum*, *Ribes*, *Elsholtzia*, *Ageratina*, Ferns and Bamboos. *Elatostema*, *Calamagrostis*, *Galium*, *Oxalis*, *Persicaria*, *Viola*, *Pilea*, *Impatiens*, *Senecio* and *Inula* form the ground cover in the lower altitude.

During the biodiversity survey 2015, 41 species of *Rhododendrons* were recorded inclusive of two endemic species viz. *Rhododendron bhutanense* and *R. kesangiae* (Annexure 3). *Rhododendron* in association with other tree species occupies the majority of the forest type – ranging from Chir pine forest to Alpine scrub. *Rhododendron grande* is the largest and tallest (up to 40cm diameter and 25m height) *Rhododendron* sp. in the Sanctuary mostly occupying cool broadleaved forest. *Rhododendron arboreum* has the widest growing range, starting from 1700m to 3500m.

Orchids are a diverse and widespread family of flowering plants, with very colourful and often fragrant flowers under *Orchidaceae* family. It has about 800-1,000 genera with 25,000-35,000 known species in the world (Gogoi, *et al.*, 2012). Out of 426 orchids in Bhutan, 131 species of orchids were recorded in SWS (Annexure 4).

1.2.6 Faunal Diversity

Owing to the presence of rugged terrain characterised by huge variation in altitude from 1500m-4500m, SWS harbours outstanding biodiversity and ecosystems. It provides home to many critically endangered and threatened faunal species. The biodiversity survey 2015 revealed assemblage of diverse terrestrial, avian and aquatic species many of which are endemic to eastern Himalayan region and of global conservation significance.

1.2.6.1 Mammals

A total of 39 mammal species was recorded representing seven orders of animal kingdom (Annexure 5). Of the aggregates, 15 species were carnivores under six families, two species each of Dog and Weasel, one species each of Red Panda, Bear and Civet and eight species of cat including Royal Bengal Tiger. Eight species of Rodents under 4 families viz. Squirrel, Porcupine, Vole and Mouse. Eight species were ungulates under 4 families composed of Antelope, Deer, Musk Deer, Takin and Pig. Remaining includes 3 species of lagomorphs, and 3 species of primates.

Out of 39 mammal species recorded from the survey, 37 species have been identified at species level and confirmed their existence. However, the confirmation of Musk Deer at species level, and existence of Clouded Leopard need further validation. The Musk Deer was believed to be wiped out from this area due to poaching before the establishment of the SWS. However, its presence was re-established during 2015 national tiger survey and SWS biodiversity survey.

1.2.6.2 Birds

Bird population trends often indicate wellbeing of ecosystem and biodiversity in nature. A total of 283 species of birds (Annexure 6) were recorded, however, the list is not exclusively exhaustive because most bird species are altitudinal and long range migrants. Hence, recording of all birds in one season was not possible.

Major group of birds recorded were Babbler (40 spp.), Warbler (27 spp.), Finch (16 spp.), Flycatchers (12 spp.), Corvid (10 spp.), Cuckoo (10 spp.), Galliformes (9 spp.), Tit (9 spp.), Bird of Prey (8 spp.) and Pigeon (8 spp.). Further, SWS also serves as potential winter roosting ground for endangered species like Black Necked Crane (*Grus nigricollis*) as evidenced in 2013 at Thrakthri and Borangmang under Sakteng Range.

1.2.6.3 Herpetofauna (Reptiles and Amphibians)

Diversity of herpetofauna was comparatively low in the Sanctuary. Only five species of reptiles and three species of amphibians were recorded during biodiversity survey 2015.

Reptile: Reptile includes five species of snakes viz. Mountain Pit Viper (*Ovophis monticola*), Green Rat Snake (*Ptyas nigromarginata*), Large-eyed Bamboo Snake (*Pseudoxenodon macrops*), Mountain Worm-eating Snake (*Trachischium* spp.), Flying Snake (*Chrysopelea* sp.), and two species of lizards viz. *Eutropis* sp. (skink) and *Japalura variegata* (East Himalayan/Variegated Mountain Lizard).

Amphibian: Three species of amphibian includes Annandale's Paa Frog (*Nanorana annandalii*), Sichuan Torrent Frog (*Amolops formosus*) and Sikkim Cat-eyed Toad (*Scutiger sikimensis*).

1.2.6.4 Fish

Despite the presence of three major river in the Sanctuary, only two species of fish were recorded; Snowtrout (*Schizothorax richardsonii*) and Khaling Torrent catfish (*Parachilognis bhutanensis*) which is believed to be endemic catfish species. A group of Snowtrout (not confirmed) yearlings was sighted along the shallow pools of Gam-ri near Joenkhar. This indicates the potential site for Snowtrout spawning in the upper reach of Gam-ri.

1.2.6.5 Butterflies

Butterflies are not only important for pollination but also perform manifold functions such as ecological, economic, educational and social. In total, 63 species of butterflies were recorded from Sanctuary (Annexure 7).

1.2.6.6 Freshwater Macro-Invertebrates

Physical, chemical and biological assessment of running water can provide a complete spectrum of water quality. Such a study entails huge investment, technical expertise and is time consuming. Yet, biological assessment alone can provide reliable information on water quality and is widely accepted (Iliopoulou-Georgudaki *et al.*, 2003). Macro-invertebrates are an

integral part of wetland ecology with diverse ecological and environmental requirements. Change in natural variables of water directly affects their composition and is a good indicator of water quality.

The quality of Gam-ri and Mera-ama-ri was good with 100% frequency of sensitive species like Stonefly, Caddisfly and Mayfly. The pollution tolerant level of Macro-invertebrates is measured in numeric values ranging from 0 to 10. At 0 it is intolerant and the tolerance level increases with increasing value up to 10. The overall tolerance level assessed for two rivers (n=30) was 3.04 (Table 1).

Table 1: Family Biotic Index of macro-invertebrate

Sl#	Order	Pollution Tolerance Value	Nos.	Encounter	Frequency	Relative Frequency	Biotic Index
1	Mayfly (Ephemeroptera)	3.5	1299	30	100.00	18.87	1.37
2	Stonefly (<i>Plecoptera</i>)	1	687	30	100.00	18.87	0.21
3	Caddisfly (<i>Ticoptera</i>)	3	868	30	100.00	18.87	0.78
4	Nematoceranfly/Midge larvae (<i>Diptera</i>)	5	332	20	66.67	12.58	0.50
5	Crane fly (<i>Diptera</i>)	5	54	17	56.67	10.69	0.08
6	Flatworm (<i>Turbellaria</i>)	4	49	17	56.67	10.69	0.06
7	Beetle (Coleoptera)	4	25	10	33.33	6.29	0.03
8	Dobsonfly (<i>Megaloptera</i>)	2	4	2	6.67	1.26	0.00
9	Worms (Oligochaeta)	8	5	2	6.67	1.26	0.01
10	Slater (<i>Isopoda</i>)	8	1	1	3.33	0.63	0.00
Total			3324	159	530.00	100.00	3.04

Note: Tolerance value has been derived from the average tolerance value of entire family

1.3 People and Culture

Merak (literally means to “set on fire”) and Sakteng (means the “plateau of Bamboo”) located in the easternmost part of Bhutan is the land of semi-nomadic community named Brokpa. They are believed to be the descendents of Triwu Jangchubsempa (Kuensel Article, April 11, 2015) and have their ancestral roots from southern Tibet (ASPEN ALPINE GUIDES, 2012).

Brokpas are a distinctive group of people in Bhutan with unique costumes with perhaps some similarities to the tribal people of Arunchal Pradesh, Indian Monpa. They can be easily distinguished from other communities of Bhutan by their costumes which are exceptionally distinct. Their costumes are typically made from wool, silk and yak’s hair to help them adapt in the harsh geographical environment. “Transhumance” a highly specialized form of mixed farming is predominantly practiced by Brokpa community involving seasonal migration of their cattle. In summer, they take their herds to mountain pasturelands from May till October. By September, they climb down for winter pasture and remain there for about five to eight months until the next migratory cycle.

1.3.1 Cultural Resources

Apart from their unique culture and traditions, Merak and Sakteng are also known for Yak cham, Arpa cham, Ache Lamoi cham and Tercham (performed once in every three years). The famous mask dance “*Ache lamoi chaam*” performed by the “*Brokpas*” takes its origin back to the era of Guru Rinpoche when he was constructing the Lhasa monastery in Tibet. It is believed that this mask dance was performed by Guru Rinpoche to subdue the demons creating nuisance during the construction of Lhasa monastery. There are also numerous important cultural sites in Merak and Sakteng such as:

1. Jomo Phodrang in Merak which is the abode of local deity Aum Jomo.
2. Gyengu and Merak Lhakhang in Merak.
3. Chorten Nagpo in Damangchung on the way to Merak that was constructed after subduing evil “*DeumHachang*” by “*sey Kuentu Legpa*” (relates to the story of *Khando Drowa Zangmo*)
4. Tsholung Gonpa in Sakteng
5. Borangtse Lhakhang in Sakteng
6. Kushu Guru and Yeujuk Lhakhang in Sakteng
7. Nyagchungla pass and Lhodrojong between Merak and Sakteng which had a significant role in the settlement of Merak and Sakteng
8. Nye Chap-shukpa in Sakteng
9. Serdam Goenpa in Joenkhar

Additionally, there are also many festivals which are of local significance (Table 2).

Table 2: Cultural calendar of Merak & Sakteng

Months (may vary according to Bhutanese calendar)	Gewog	
	Merak	Sakteng
January	-	Tenda Tshechu
May	-	Jomo Soecha
June	Jomo offering &Tenda Rimdro	Tercham (Once in 3 years)Trenda
July	Choekor	Choekor
August	Jomo Tshechu	Jomo Sekha
September	Jomo Kora & Jomo offering	Choekor
October	Jomo Tsekha	-

1.3.2 Socioeconomic Situation

Merak and Sakteng have remained in isolation from the rest of the country for many decades until recently and are considered the poorest Gewogs with 46.9% poverty rate (Trashigang, 2011). The road accessibility to Merak has reached only in 2015 which still get extremely difficult to ply during monsoon season. For Sakteng Gewog, the road is still under construction and may take another couple of years to complete.

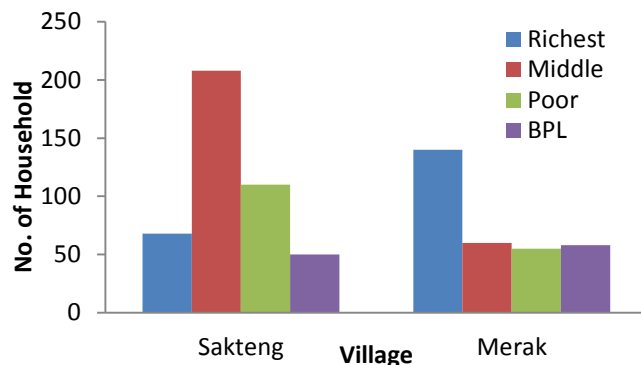


Figure 4: Wealth Category (Merak & Sakteng)

However, with recent advancement of infrastructure development such as road and electricity connectivity, the living standard of these two communities have improved manifold. It has not only created more employment opportunities for the local people but also has attracted increasing number of tourists. The motor roads have given better market accessibility to the people to sell their products in wide range.

From the wealth ranking exercises conducted during the social survey in 2015, the majority of the households fall into “Middle” income category with mean annual income of Nu. 75,000.00 per household. Only few households fall in the “Poor” and “BPL” categories with mean annual income of Nu. 32,500.00 and Nu. 12,500.00 per HH respectively (Figure 4).

1.3.3 Local Economy

More than 85% of the people in Merak and Sakteng practice semi-nomadic lifestyle with only a few households engaged in subsistence agriculture. Livestock farming is the mainstream occupation followed by civil servants and others (Figure 5). The “Others” includes occupation such as carpenter, weaver, cook, driver, caretaker, contractor, guide, painter, babysitter and helper. “Religious activities” are referred to monks, nuns, gomchen and tsampas.

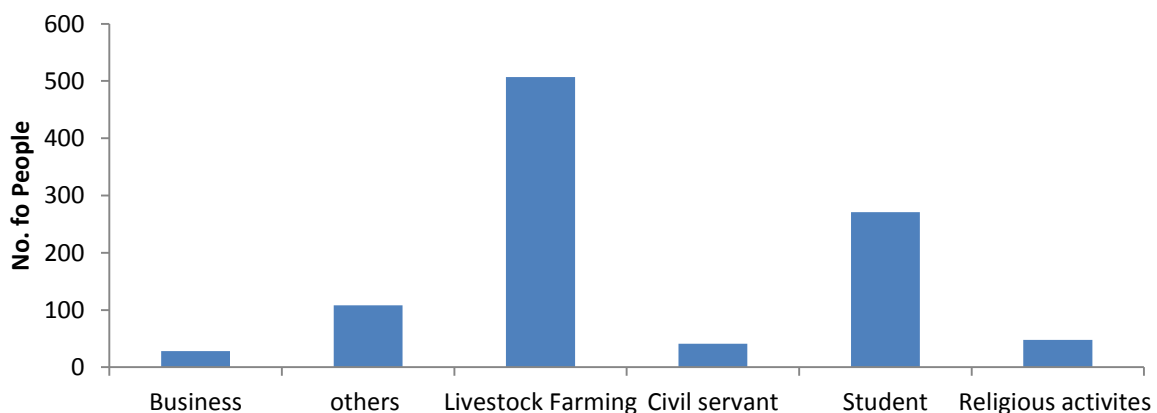


Figure 5: Occupational Group (Merak & Sakteng)

Main sources of income for these two communities are from the sales of livestock produce such as butter, cheese, fermented cheese “Yoshu”, meat and wool to the nearby towns. Of late, they have also started collecting minor forest produce such as mushrooms, wild vegetables, tubers, incense making herbs and medicinal plants to supplement their income. These products are either marketed for cash or barter for grains and other necessary items that are not available locally.

1.3.4 Demography

Close to 5000 people in 13 villages with 772 households (Table 3) from two Gewogs of Merak and Sakteng resides inside the Sanctuary. Similar to situations of most villages in Bhutan, residents of Merak and Sakteng are mostly old and infants. Many adults and younger generation have migrated to different places in search of better education and employment opportunities.

Thimphu is rated as most preferred destination for out-migration of the productive people followed by Phongmey and Shingkhari respectively (Figure 6). Few people even migrate to the Indian State of Arunachal Pradesh because of the close interaction and proximity. The majority of teenagers leave for education and remain away from villages most of the time.

Table 3: No. of HH (Merak&Sakteng)

Sl#	Village	Gewog	No. of HH
1	Sakteng	Sakteng	104
2	Borangmang	Sakteng	64
3	Dak	Sakteng	12
4	Thelon	Sakteng	19
5	Joenkhar	Sakteng	23
6	Tengma	Sakteng	130
7	Murbee	Sakteng	28
8	Pussa	Sakteng	20
9	Thrakthri	Sakteng	52
10	Merak	Merak	235
11	Gyengu	Merak	58
12	Kheliphhu	Merak	12
13	Khashiteng	Merak	15
Total			772

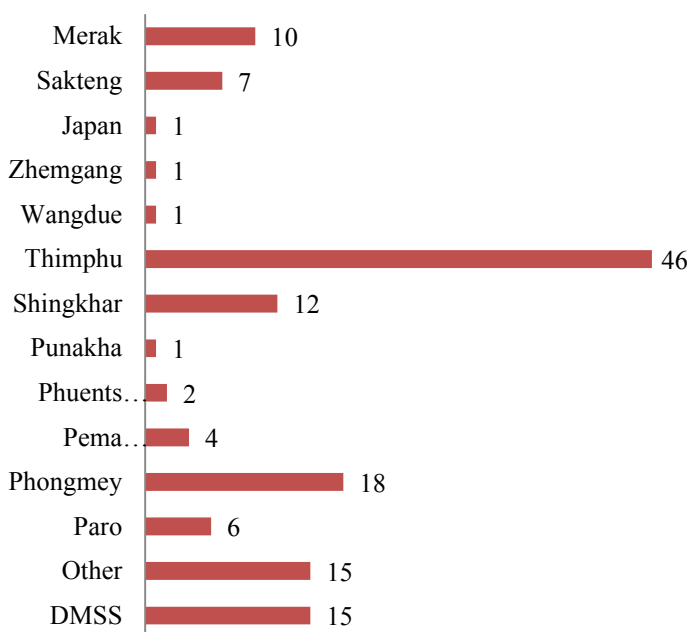


Figure 6: Different Migratory Destination

1.4 Service Sectors

Service Sectors are extremely vital for timely delivery of public services required by the community. Most of the essential Service Sectors are well established with adequate number of human resources both in Merak and Sakteng (Table 4).

Table 4: Service sectors in Merak & Sakteng

Sl #	Service Sector Name	Quantity	Location
1	Dungkhag Administration	1	Sakteng
2	Dungkhag Court	1	Sakteng
3	Gewog Administration	2	Merak & Sakteng
4	Basic Health Unit	3	Merak, Sakteng & Joenkhar
5	Police Station	1	Sakteng
6	Lower Secondary School	1	Sakteng
7	Primary School	2	Merak & Joenkhar
8	Community Information Centre	2	Merak & Sakteng
9	Extended Class Room	1	Thrakthri
10	Renewable Natural Resources Extension Centre	3	Merak, Sakteng & Joenkhar
11	Bhutan Development Bank Limited	1	Sakteng
12	Royal Insurance Corporation of Bhutan Limited	1	Sakteng
13	Park Range Office	3	Joenkhar, Merak & Sakteng
14	Park Guard Post	1	Thrakthri
15	Shedra (Buddhist Institute)	1	Sakteng
16	Early Childhood Care & Development	2	Merak & Sakteng
17	Out Reach Clinic	2	Chipling & Thrakthri

1.5 Administration

SWS is divided into three ranges viz. Merak, Sakteng and Joenkhar (Figure 7). Chief Forestry Officer heads the Sanctuary management supported by field and functional units (Figure8). The Sanctuary head office is located at Phongmey, Trashigang.

SWS cover 67.30% of Merak and 85.2% of Sakteng Gewog area under Trashigang Dzonkhag and a part of Lauri Gewog 9.4% under Samdrup Jongkhar Dzonkhag. However, the SWS management is providing forestry services to total households under Merak and Sakteng Gewogs. Hence, the Sanctuary management is in the process of extending its area to total Gewog area of Merak and Sakteng.

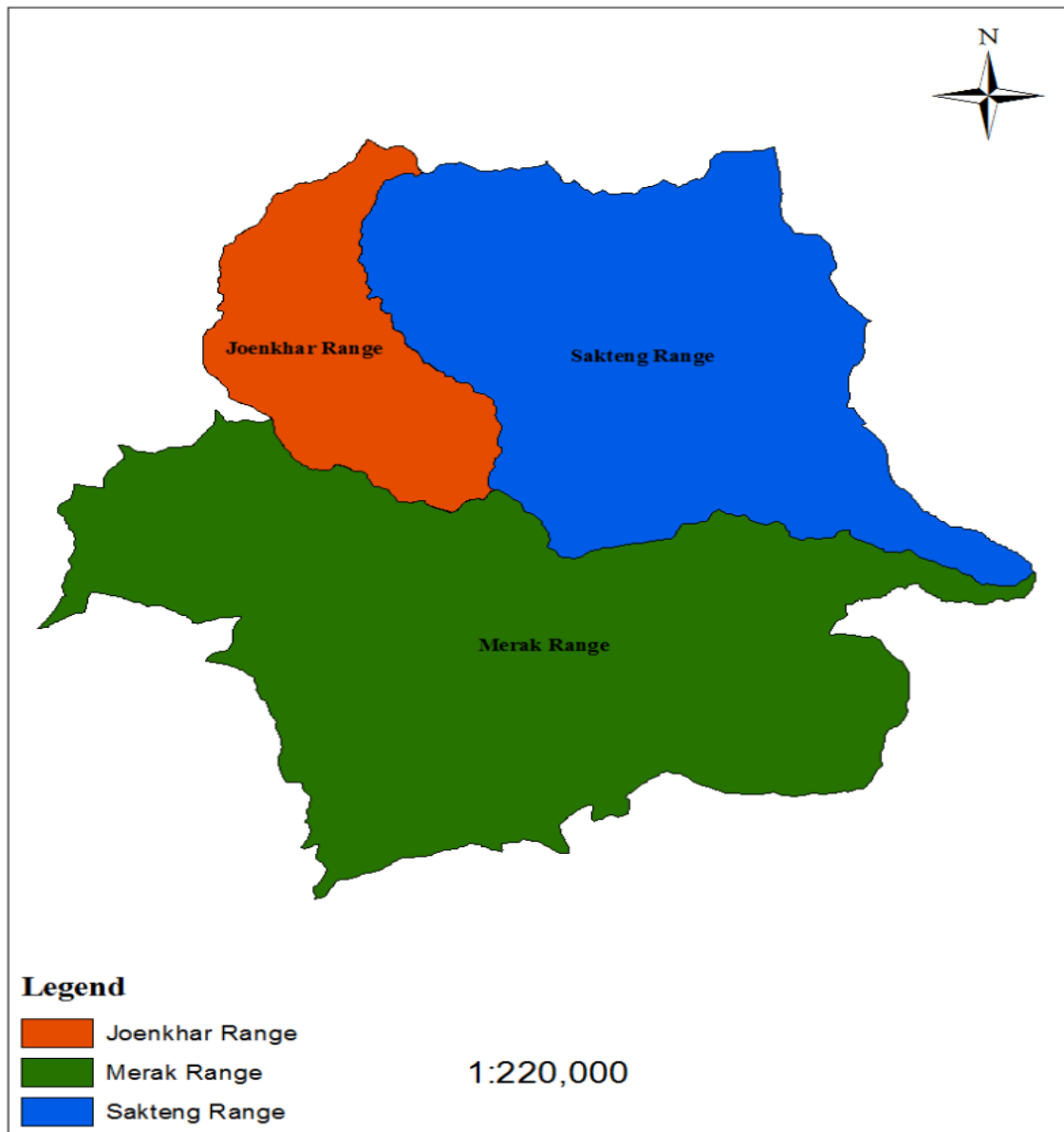


Figure 7: Range jurisdiction

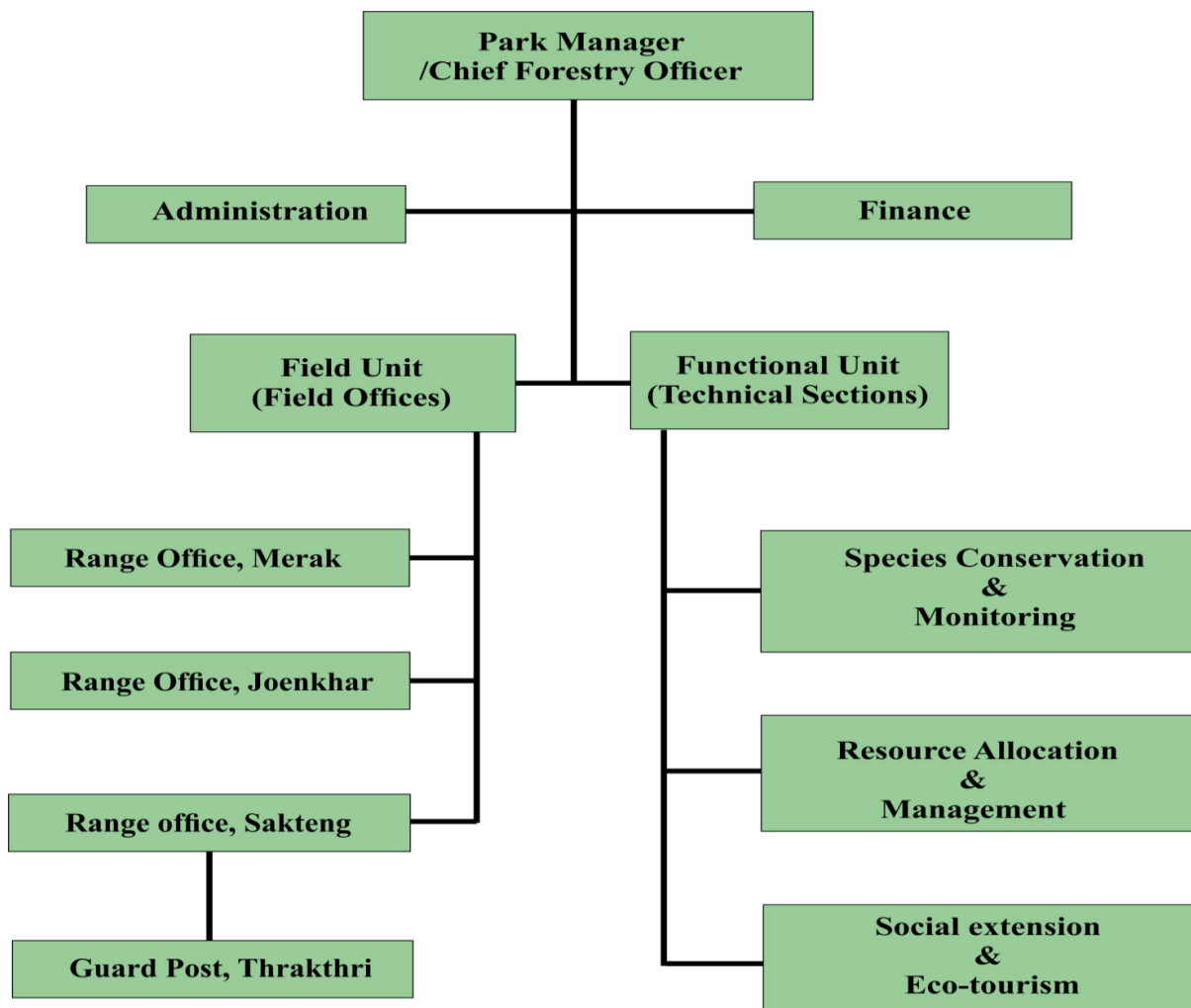


Figure 8: SWS organogram

1.5.1 Existing Infrastructure

SWS Head office comprises of two storied office building, one unit Park Manager’s resident and four unit staff quarter constructed with the funding support of WWF-Bhutan Program. Range Office –cum- transit camp building at Merak, Sakteng and Joenkhar and additional four unit staff quarter at SWS HQ constructed through RGoB funding.

1.5.2 Mobility

Toyota hilux procured with funding support of BTFEC is the only pool vehicle that enables the movement of the staffs. Consequently, there is an urgent need of additional one 4WD vehicle and four motor bikes to perform day to day activity efficiently and smoothly.

1.6 Synoptic Review of Past Management Plan

Sakteng Wildlife Sanctuary was operationalized on 17 April 2003 with the establishment of its head office at Radhi, Trashigang. For timely service delivery and efficient implementation of the conservation programs, three field offices at Merak, Sakteng and Joenkhar were established.

The first management plan was written and approved after five years of its establishment (2008-2013). Most activities were focused on infrastructure development, species conservation and livelihood enhancement through Integrated Conservation Development Program (ICDP). The RGoB, WWF-Bhutan, Tourism Council of Bhutan (TCB), Market Access and Growth Intensification Project (MAGIP) under International Fund for Agricultural Development (IFAD) and BTFEC were the main funding agencies. A summary of program activities implemented and outcomes achieved from the first management plan is provided for reference and future direction.

1.6.1 Infrastructure Development

Considerable effort has been put in building infrastructure and communication facilities. Major achievements include the construction of the head office and staff quarters at Phongmey, and range offices –cum- transit camp at Merak, Joenkhar and Sakteng.

Nine new traditional bridges were constructed to improve the accessibility of the local community especially in the monsoon. Furthermore, a number of trails and mule tracks were maintained. Investment in telecommunication and internet facilities was also made to enhance the efficiency of the Sanctuary staff.

1.6.2 Species Conservation

Advocacy and awareness programs have been pursued rigorously to achieve the objective of species conservation. Regular education on Forest and Nature Conservation Acts and Rules, awareness on the importance of conservation and the need to protect environmental heritage have also been conducted. Specific advocacy and awareness education on the importance of conserving Red Fox, Himalayan Goral, Himalayan Serow, Musk Deer and Pheasants have been conducted repeatedly.

Documentation of a few important species has also been initiated to promote species conservation. A detail study on distribution, habitat use and threats of Red Panda was conducted to provide relevant policy recommendations and develop conservation action plans for SWS. This research finding has helped the management to secure a rangeland management project for the herders of Merak from the UK DARWIN Initiative Fund. Recording of 39 mammal species in the 2015 terrestrial biodiversity survey is a good indicator of the effect of awareness and anti-poaching conducted as the plan prescription.

1.6.3 Integrated Conservation and Development Program

ICDP was initiated to generate community support in species conservation and resource management. Activities ranged from supply of agricultural inputs such as improved seeds, agricultural tools, and polyhouses to supply of subsidized solar lamps and Corrugated Galvanised Iron (CGI) sheets for roofing. A total of 628 households have been roofed with CGI sheets through donor support on a cost sharing basis. Additionally, 32 polyhouses have been supplied to individual household and schools for vegetable production.

A total of 46 households have been provided with wash basins, geysers and toilet pots to promote homestay development in the villages. Construction of five tourist campsites at different locations and development of new eco-trails and trail maintenance have been carried out to promote ecotourism in SWS.

1.6.4 Livelihood Enhancement

The SWS have provided homestay management and chef training in addition to supply of agricultural seeds and poly houses as a part of livelihood enhancement program.

The department of livestock has also initiated numerous programs targeted towards enhancing the livelihoods of Brokpa community. Improved yak breeding bulls and milk skimming equipment were supplied through a donor supported project. More than five cooperative groups have been formed to manage products ranging from dairy to Non Wood Forest Produce (NWFP) from the forest.

1.6.5 Capacity Development

Competent human resource is the key for successful implementation of conservation programs and enforcement of forest rules and regulations. Substantial efforts have been put to develop capable and proficient human resources since last few years.

Short trainings in biodiversity and protected area management have been organized. Study tours on ecotourism and rural livelihood initiatives have been provided to all staffs.

1.6.6 Zonation

Zonation was considered imperative for appropriate planning and management interventions as there are numerous settlements and grazing areas spread all across the Sanctuary. This would ensure ecologically functional landscapes to guarantee viable movement of species. Accordingly, the zonation was completed in 2011, declaring 19.7% of the total area as core zone and 80.3% as multiple use zone. Buffer zones were designated outside the Sanctuary area.

Chapter II: Analysis of Issues and Problems

2.1 Resource Use, Poaching and Associated Threats

2.1.1 Timber and Firewood Consumption

Annually, significant quantities of timbers have been allotted for rural house construction and maintenance as well as renovation of important religious structures (Figure 9). We also cater to the commercial demand for infrastructure development within the SWS jurisdiction.

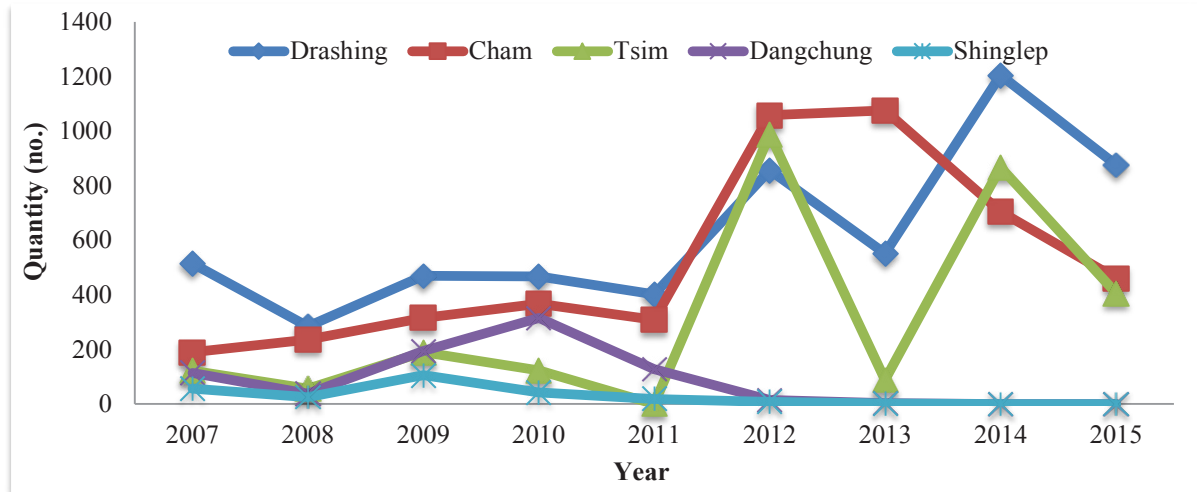


Figure 9: Timber supply trend (2007-2015)

Analyses of past records indicate increasing allocation of timbers to people from outside SWS leading to depletion of timber stock. Although electricity connection provides better energy alternatives, people still prefer firewood for cooking and heating purposes (Figure 10).

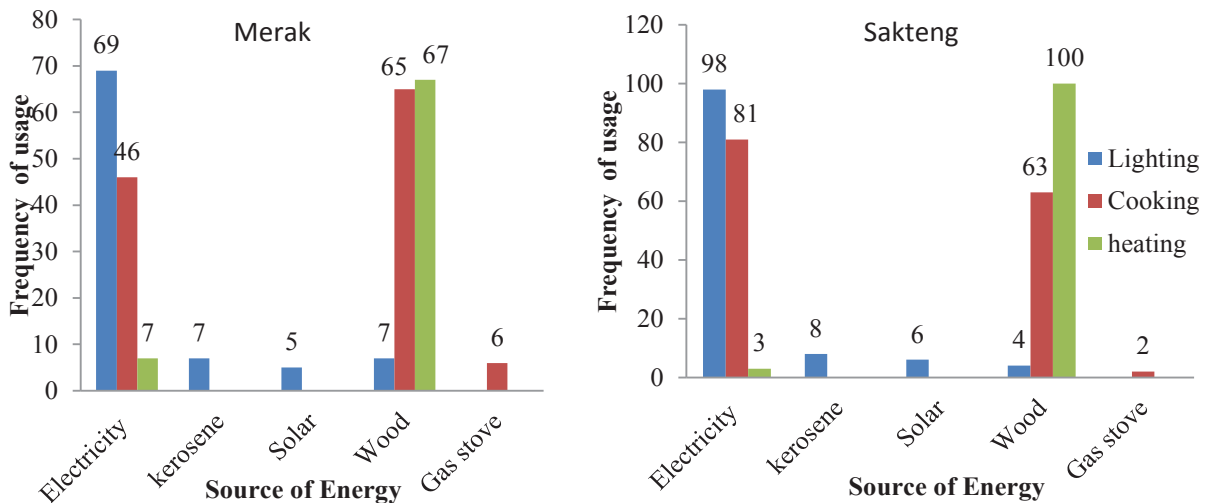


Figure 10: Energy usage in Merak & Sakteng (n=174 HH)

Consequently, the firewood consumption is significant in all villages in two Gewogs (Figure 11). A substantial amount of firewood is consumed by schools within the Sanctuary. An average of 583.92m³ of firewood equivalent to 292 standing trees are consumed annually (Table 5).

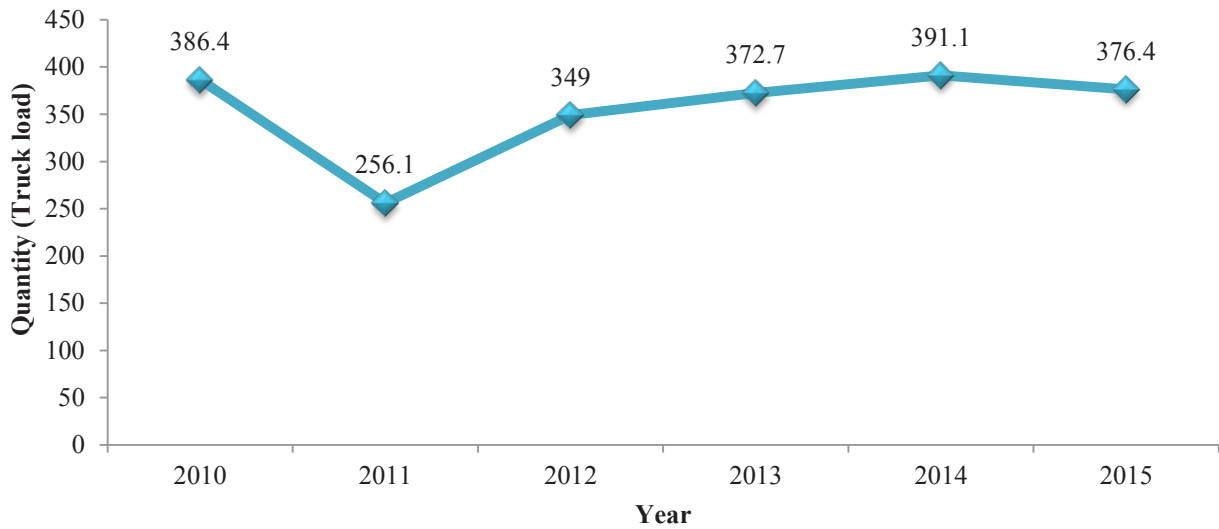


Figure 11: Firewood supply trend in Merak & Sakteng

Table 5: Firewood consumption in schools (Merak & Sakteng)

Name of the School	Merak	Sakteng	Joenkhar	Total
Number of Students (2015)	144	288	61	493
Quantity of Firewood Consumed in (m ³)	324.20	195.72	64.00	583.92

2.1.2 Sand and Stone Consumption

In addition to timber and firewood, significant amounts of sand and stone are being collected from the Sanctuaryadministered areas for construction of government offices and other infrastructures (Figure 12).

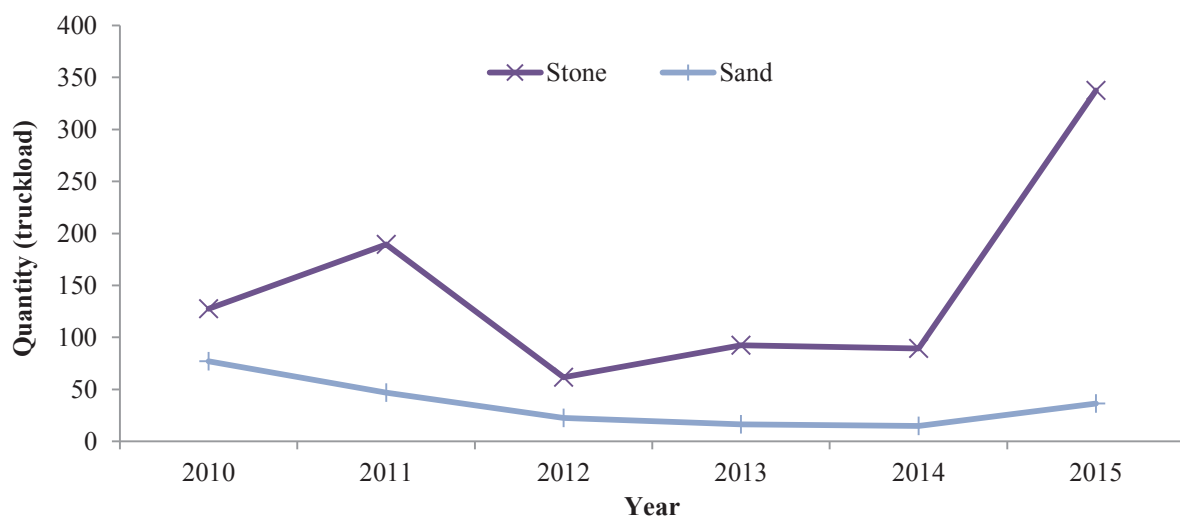


Figure 12: Sand & stone supply trend

2.1.3 Illegal Activities

The majority of offences in the Sanctuary area are associated with illegal timber harvesting and transportation followed by girdling of trees (Figure 13).

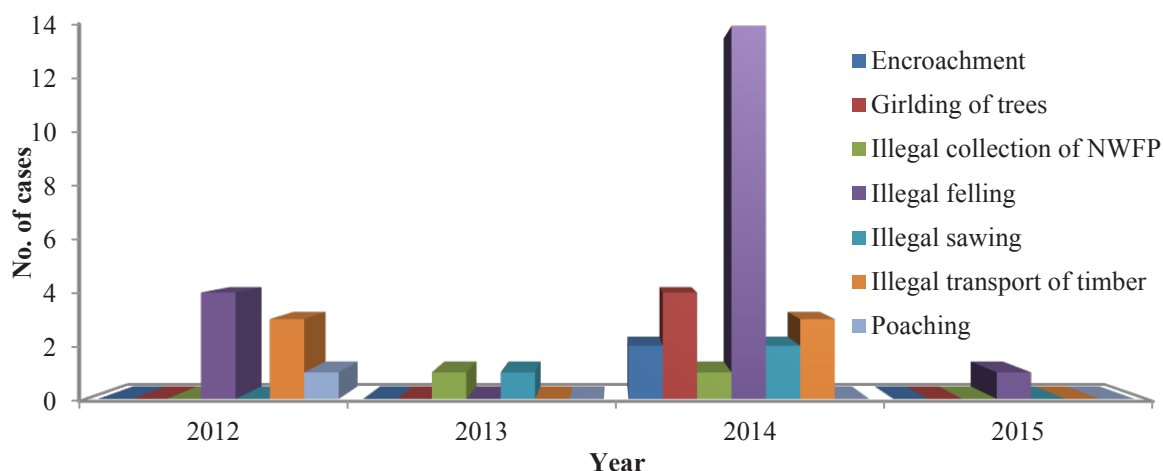


Figure 13: Forest offence trend

While most offences indicate a declining trend, illegal timber harvesting and transportation has significantly increased in 2013-2014, which could be due to the arrival of road accessibility. Also, the risk of poaching cannot be neglected as the people of Merak and Sakteng are often caught carrying unlawful animal products in other places.

2.1.4 Livestock and Grazing

More than 85% of the community depends on livestock farming. Their livestock migrates seasonally from alpine mountains to low lying areas in winter and vice versa in summer. Consequently, the grazing pressure on the forest is immensely high compared to other protected areas. Landuse analysis of SWS shows 38.5% of the total land area is open pasture and it spreads sporadically all across the Sanctuary. Most of this pasture is being continuously grazed with little or no management interventions.

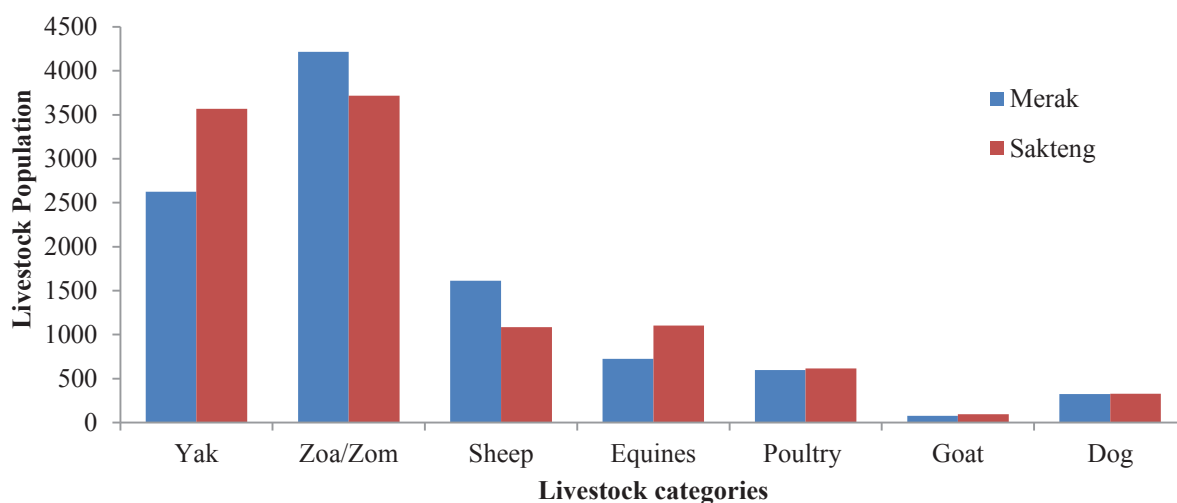


Figure 14: Average livestock population in two Gewogs

Considering that 75% of the Sanctuary area (554.4 km²) is accessible and 16,941 cattle (Figure 14) are being grazing in the forests, estimated cattle density is 30.5 heads/km² compared to 11.2 heads/km² of national grazing density (RNR Statistics, 2015). However, Sanctuary management should determine the extent of grazing and its impact on certain forest types.

Only about 18% of the total cattle population (n=173) was found productive (milking cow) and rest 82% are unproductive adding tremendous pressure to limited pasture land and natural forests.

People have also raised concerns of a rapid decline in sheep population in several meetings and discussions. Sheep provide essential raw materials for making their traditional dress that is unique from other parts of the country.

2.1.5 Tsamdro (Pasture land)

Tsamdro is the lifeline of the Brokpa community due to limited agricultural land holdings and unfavourable environmental conditions. The yearly increase in the number of livestock population and decrease of grazing area due to invasion of unpalatable plant species exerts huge challenges to the community. Prevalence of continuous unmanaged grazing is a serious threat that needs to be addressed without delay.

The socio-economic survey indicates that the community of Sakteng owns more Tsamdro than the community of Merak (Figure 15). However, detailed study needs to be conducted to ascertain the Tsamdro holdings by individual household.

Community responses on sufficiency of Tsamdro (Figure 16) shows that the majority of the people do not own sufficient Tsamdro leading to excessive grazing and degradation of the available Tsamdro. Apart from Tsamdro degradation, continuous grazing also impedes the forest regeneration because of the continuous trampling effect.

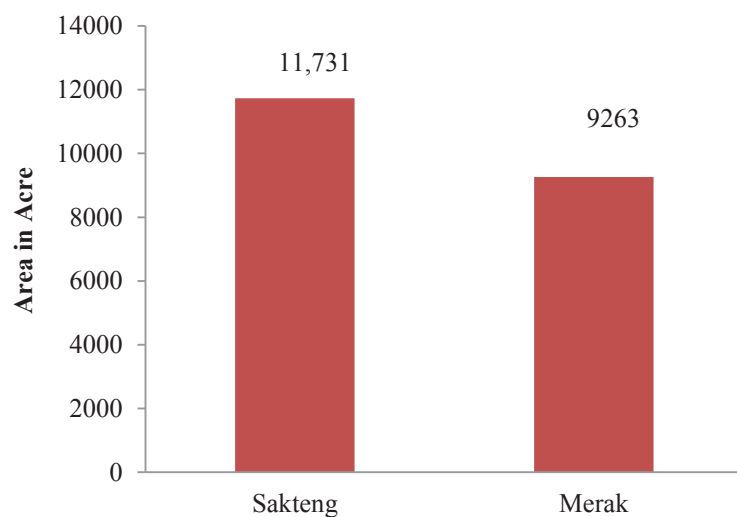


Figure 15: Average total Tsamdro area owned

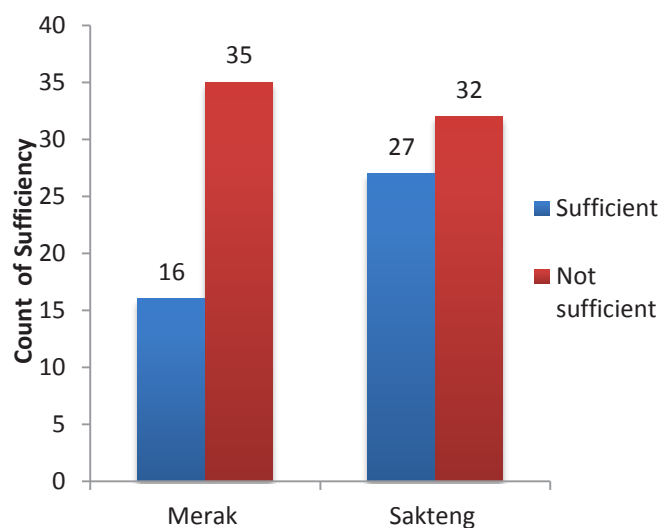


Figure 16: Peoples response on sufficiency of Tsamdro

2.1.6 Livestock Depredation

Frequent loss of livestock to wild predator affects the economy of the herders. An analysis of the social survey report indicates that yak often falls prey to wild predators followed by sheep and Dzo/Dzoms (Figure 17).

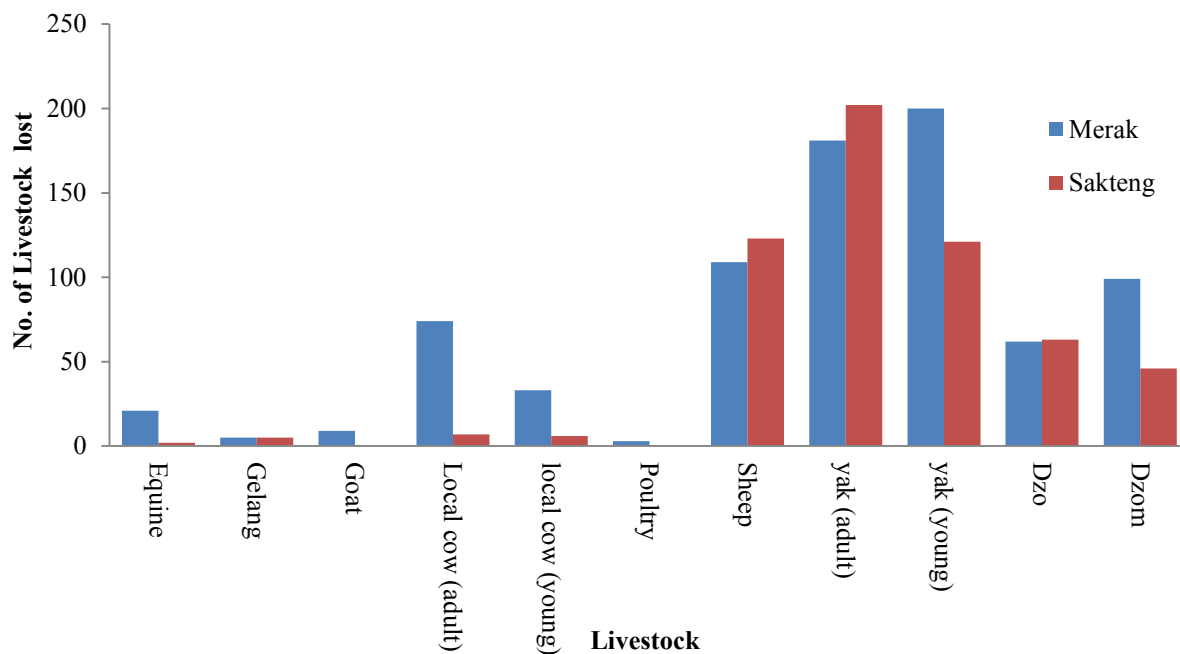


Figure 17: Average no. of livestock loss to wild predators in last 10 years

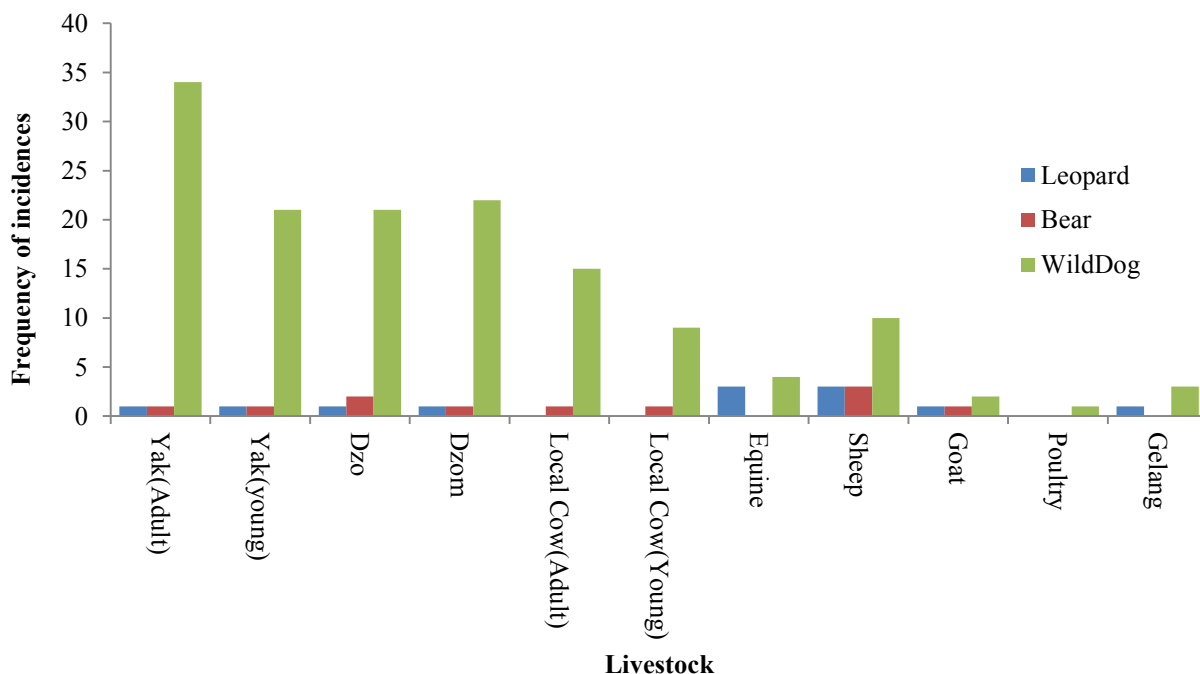


Figure 18: Common wild predator of livestock

Wild Dog is the most prominent predators attacking the livestock in SWS followed by leopard and bear (figure 18). If this issue is not discussed and strategized on time, it will lead to serious human-wildlife confrontations and may suffer negative consequences.

2.1.7 Agriculture and Crop Depredation

Only about 8% of the area is agriculture land and most of this is located in the lower valleys such as Joenkhar, Thrakthri, Tholong, Dak, Khashiteng, Kheliphu and Murbee community. Agriculture land holdings by individual household are minimal compared to other communities of the same Dzongkhag who practice subsistence farming.

Despite small land holdings, people grow cereals such as maize, buckwheat, barley and dry land paddy for self-consumption. Additionally, they also grow seasonal vegetables like potato, cabbage, spinach, cauliflower, broccoli, radish, and pumpkin to be marketed (Figure 19). Those households owning little agriculture land in the higher altitude grow a few varieties of vegetables that cope with harsh climatic conditions. Apart from insufficient land to grow agricultural crops, significant damages from wild and domestic animals makes people reluctant to invest in agriculture (Figure 20).

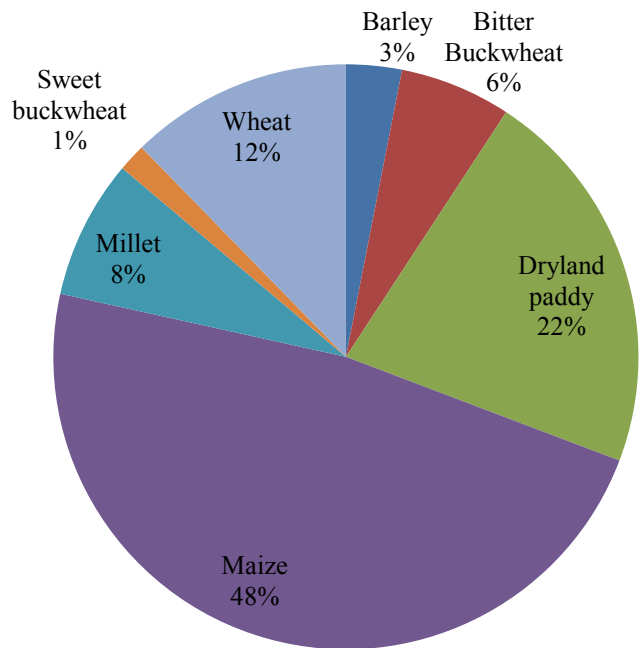


Figure 19: Cereals grown by the community

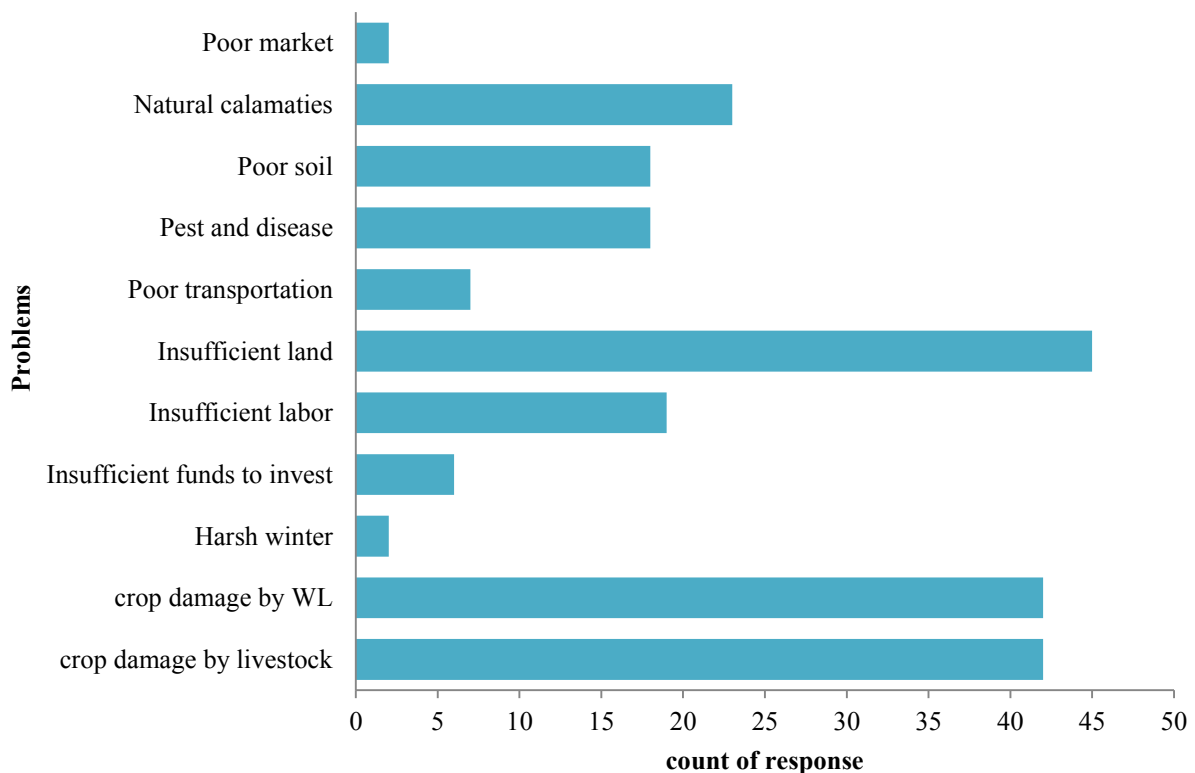


Figure 20: Major issues/problem with agriculture farming

The highest crop depredation by wild animal has been reported in villages under Sakteng. Merak receives minimal nuisance from wild animal to their agriculture crops and also very few HHs practice agriculture farming. Porcupine is reported as most destructive animal attacking their crops followed by monkey and wild boar (Figure 21).

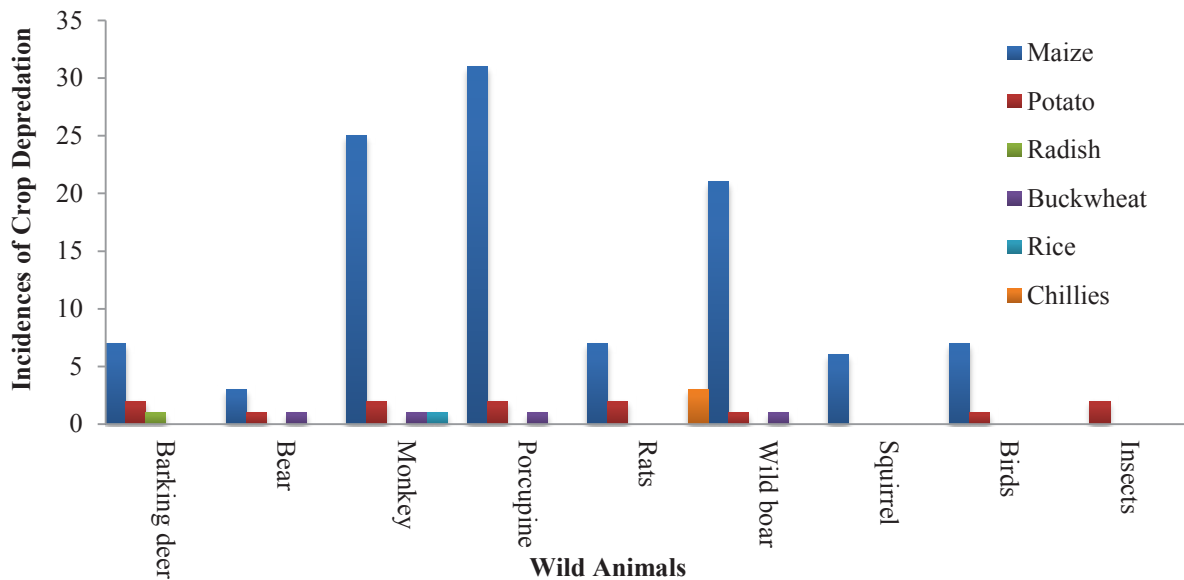


Figure 21: Crop depredation, preferred crop and problem wildlife species

2.1.8 Livestock Population

Figure 22 is generated based on the livestock statistics 2007-2015 published by the department of livestock, MoAF.

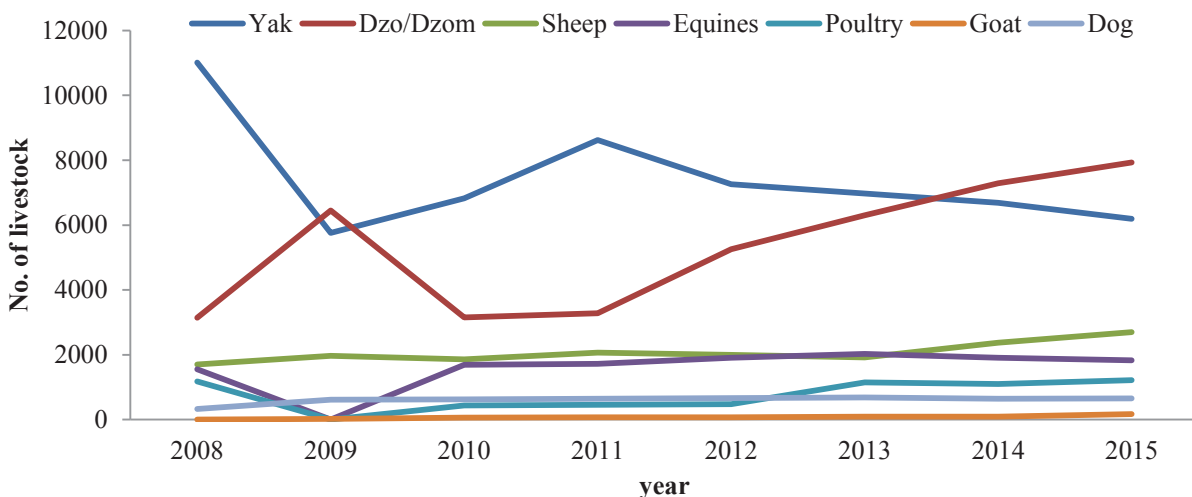


Figure 22: Livestock population trend in Merak & Sakteng

From the figure, it can be concluded that there is a decrease in the yak population whereas the population of Dzo/Dzom has increased rapidly. The poultry population has also increased in both the Gewogs.

Specific studies need to be carried out to find the change in the livestock rearing pattern and trend by the people of Merak and Sakteng. The population dynamics of the livestock will help in proper management of the natural resources by studying the feeding habits and the migratory pattern to emphasize on coexistence of wild animals and human beings.

2.2 Environmental, Biodiversity and Species Conservation threats

2.2.1 Habitat Fragmentation

Habitat fragmentation is one of the most detrimental driving forces for loss of biodiversity. Livestock grazing, construction of road, hydropower transmission line, and over exploitation of forest produce are major factors contributing to habitat fragmentation in the Sanctuary.

2.2.1.1 Road and Hydropower Transmission Line

Roads and hydropower construction is inevitable for economic development. Numbers of farm roads have been constructed in the recent years passing right through the Sanctuary. Clearing of forests and dumping of muck and debris is a major cause of habitat fragmentation leading to restriction of wild animal movements and inbreeding.

Apart from habitat fragmentation, pressures on forest resources have increased drastically due to easy accessibility. Further, the timber demand from adjoining Gewogs has increased manifold leading to depletion of timber resources in the area.

2.2.2 Species

Lack of knowledge and information on species population and their habitat associations is the key factor that seriously hampers the implementation of species conservation initiatives.

Often policy strategy and conservation initiatives are flawed because of lack of insight into species and associated parameters. Species persistence and dispersal is the primary goal for any PAs. Tree species such as *Quercus semecarpifolia*, *Michelia* spp., *Pinus bhutanica*, *P. roxburghii*, *Picea spinulosa* and *Taxus baccata* are highly preferred timber and firewood species sought after by the people. However, these species have become major causes of concern for the SWS management.

Quercus semecarpifolia: Natural growth of this species is concentrated only along Gam-ri in the upper ridge of Sakteng valley. It is the most preferred firewood species for the local residents yet their regeneration ecology is poorly documented and understood.

***Michelia* spp.**: Champ is considered as one of the finest timber species for furniture and house construction in Bhutan besides Teak. Its high timber value and extensive demand has led to over exploitation in the accessible natural habitat. The regeneration ecology and management aspect of this species is also limited especially for SWS area.

Picea spinulosa: Spruce in general is not a cause of concern for forest conservationist but in SWS, it is locally rare and endangered. Only countable numbers of immature Spruce trees can be seen around Pussa village under Sakteng Gewog.

Pinus bhutanica: Few stands of Bhutan pine is grown mostly in the lower altitude in the sloppy area. However, poor regeneration status was recorded.

Pinus roxburghii: Only a few patches of Chir pine forest are observed in the lower altitude in association with broadleaved species. This species is gradually being replaced by fast growing broadleaved species and may be extinct completely from the area. Appropriate management interventions can save the Chir pine from local extinction.

Taxus baccata: This totally protected plant species listed in Schedule-I of FNCA of Bhutan (1995) is a blessing to SWS. However, this species is categorized as least concerned in the IUCN red list of threaten species. The species is found in Europe up to Northern Iran and in Northern African countries of Morocco and Algeria (Farjon, A. 2013). On the other hand *Taxus wallichiana* (Himalayan Yew) native to Himalaya and parts of south-east Asia is listed as endangered in IUCN red list of threatened species (Thomas, P. & Farjon, A. 2011). Therefore, there is need to confirm specific epithet of the *Taxus* species found in SWS.

2.2.2.1 Poaching of Flora and Fauna

While offences trends indicate a decline, it is understood that poaching of flora and fauna still prevalent within SWS jurisdiction. It is mainly because of people's constant interaction with nature for daily sustenance. The majority of people remain in the forest with their livestock throughout the year and chances of their encounter with wild animal are exceedingly high. Additionally, emergence of lucrative unlawfull markets for animal and medicinal plant species encourages people to engage in poaching activities.

Medicinal plant species such as *Paris polyphylla*, *Aconitum* spp., *Rhododendron* spp., *Swertia chirata*, *Gentiana* spp. and *Panax pseudogensing* are rampantly poached for easy money. Similarly, the excessive collection of incense raw materials, wood burr and Daphne for traditional paper making pose significant threats to the sustainability of these NWFP species.

Chapter III: Vision and Objectives

3.1 Vision

Conserve the assemblage of Eastern Himalayan Ecosystem and Unique Cultural Heritage to maintain Ecological Integrity and Social Wellbeing.

3.2 Mission

Maintain the representative biodiversity of Eastern Himalayan Ecosystem through scientific management and promotion of culture while enhancing local livelihoods through nature based enterprises and community ecotourism initiatives.

3.3 Goal

Ensure ecological integrity and enhance local economy with minimum impact on age old culture and tradition of local people.

3.4 Conservation Objectives

1. Protect and rehabilitate important habitats and watersheds including grazing lands.
2. Alleviate human wildlife conflict through strategic programs.
3. Promote unique culture and traditions of the local people.
4. Enhance livelihood of the local people without compromising age old culture and tradition.
5. Promote and facilitate research, education and awareness.
6. Provide maximum protection to representative ecosystems through building strategic conservation programs for keystone/flagship species.
7. Ensure sustainable utilization of natural resources through appropriate strategies and management plans.
8. Initiate climate change adaptation programs.
9. Enhance competency and the institutional capacity for efficient service delivery and Sanctuary management.
10. Monitoring and evaluation of programs and activities in line with Bhutan Management Effectiveness Tracking Tool Plus (METT+).

Chapter IV: Zoning and It's Objectives

Considering the uniqueness of protected areas with people residing inside the park, participatory based zoning is considered an integral part of management tool to balance social and ecological aspects of the PA. Participatory zoning is not only restricted in designation of an area for specific use but rather it is an agreement on location, area user rights, duties and responsibilities of all stakeholders and serves as a clear division of roles and working agreements among all stakeholders.

The Sanctuary management has successfully conducted its participatory zoning in 2011 and demarcated core, multiple use and buffer zones to meet specific objectives (Figure 23).

In addition to three zones, the Sanctuary will further designate a special protection zone based on emerging needs to protect and conserve critical watershed areas and habitat of concerned species in future.

4.1 Core Zone

Core zone is an area where any kind of anthropogenic activities are strictly prohibited except regulated scientific studies for implementing successful conservation initiatives. The core zone represents all types of ecosystem primarily designated to protect, conserve and promote the ecological integrity of one or more ecosystems for present and future generations.

Participatory zoning for SWS (2011) has demarcated eight core zones covering 19.73% (146.08 km²) of the Sanctuary based on endemism, richness of biodiversity and pristine wild habitats for globally significant species of flora and fauna. Further, these core zones are clustered into three groups based on their ecological connectivity to each other (Table 6).

4.2 Multiple Use Zone

These zones are intended to cater for all types of goods and services obtained from nature that contributes to local people's livelihood on sustainable basis.

Areas within the Sanctuary that are not included in core zones are designated as the multiple use zones (80.3%). Activities like recreation/eco-tourism, sustainable use of natural resource

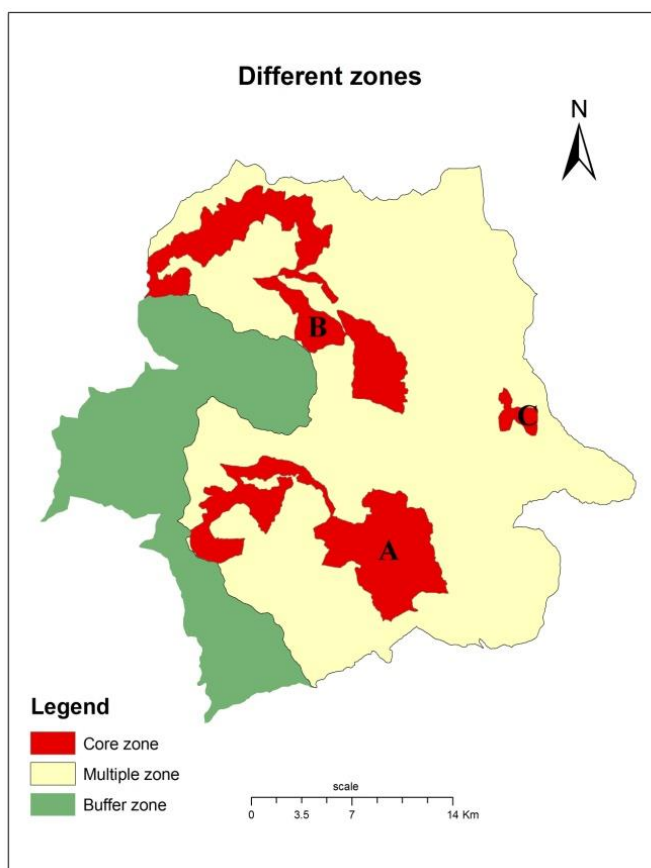


Figure 23: Zonation map of SWS

and grazing by the traditional right holders are permitted in this zone with constant monitoring from the Sanctuary management.

Table 6: Zone details

Clusters	Location of the zone	Vegetation type	Way forward
A	Yanglay- Yangchung	Cool broadleaved to Alpine forest	Ground verification works need to be carried out to redefine and re-designate specific objectives to respective core zones based on specific ecological importance of the locality.
	Merak	Conifer forest	
	Jomo Phodrang	Conifer to Alpine forest	
	Dorbrok	Mixed conifer to Alpine forest with good growth of bamboo	
B	Pherilock	Cool broadleaved, Conifer to Alpine forest	
	Baythangtse	Cool broadleaved to Mixed conifer forest	
	Gelong phukpa	Warm broadleaved to Temperate forest	
C	Dalam	Fir forest	

4.3 Buffer Zone

The buffer zone is a stretch of area adjacent to the legal boundaries of the established Sanctuary to provide extra layers of protection to minimize biotic pressure from outsiders. Participatory zoning (SWS, 2011) has demarcated the remaining portion of Merak and Sakteng Gewogs as a buffer zone. However, such zones were not designated to the Northern and Eastern part of the Sanctuary owing to international boundaries with Indian state of Arunachal Pradesh.

Monitoring and regulation of sustainable use of natural resources in such zones are conducted by the management of the Sanctuary although its area is not included into its legal jurisdiction.

The Southern part of the SWS which falls within the jurisdiction of Samdrup Jongkhar district was left without buffer zone during the 2011 zoning despite the rich subtropical habitat.

4.4 Special Protection Zone

The primary objective of establishing the proposed special protection zones is to protect, conserve and promote biodiversity and wild habitats that are degraded. Such zone can be established in any part or within the multiple use and buffer zones to restore the degrading ecosystem and biodiversity.

Chapter V: The Conservation Management Plan

5.1 Guiding Principles for Plan Implementation

1. This document is in addition and not substitute to all other Act, Rules and Regulation of the Royal Government of Bhutan and must be abide by any amendments and revision made thereof.
2. The Royal Government is already overburdened by priority development activities and meeting recurrent cost of the Government institutions. Hence, funds for the program prescribed in this plan should be as far as possible met from potential donors.
3. The plan has been formulated for ten years with intent to provide the managers with ample time for writing proposals, securing funding and timely implementation of plan prescriptions.
4. The prescribed programs should be reviewed and revised annually to accommodate any changes in policy, environment, overall Five Year Plan of the RGoB and Department.
5. In accordance to the programs outlined in this document, annual work plans should be prepared and review periodically in line with the Individual Work Plan (IWP) and Annual Performance Appraisal (APA) system adopted by the RGoB.
6. For effective implementation of the management plan and to fix accountability, SWS management should assign focal persons to monitor and evaluate the implementation of management plan prescriptions.

5.2 Legislation

This management plan draws its legal mandates from the Forests and Nature Conservation Act (1995), Forest Policy (2011) and subsequent Forest and Nature Conservation Rules (2006). By default, the management of the Sanctuary will be determined by subsequent changes in any of these above mentioned legislative tools. Furthermore, mandates and functions of the Sanctuary will also be drawn as per the relevant sections of the Land Act (2007).

5.3 Management Plan Prescription

In this section, we outline the strategic plan prescriptions to address social and conservation issues, and local people's expectation discussed in Chapter II to achieve the vision and overall goal of the SWS.

5.3.1 Insufficient Tsamdro (Pasture land)

5.3.1.1 Rationale

More than 85% of the Brokpa community are pastoralist herding their cattle in the open forest. Of the total Sanctuary area, only 38.5% is open pasture supporting an estimate of 16,941 cattle heads. Continuous grazing by livestock is considered as the main cause of Tsamdro degradation but there is no substantial data available to support the statement.

An analysis of past livestock records indicates an increasing population trend; however, authentication needs to be done as people never report the correct number of livestock during the time of census. On the other hand, the area of Tsamdro remains more or the less same and at times gets reduced due to invasion by unpalatable plant species. Livestock grazing has always been an important issue for the PA management. Generally, it has been observed that over grazing has a negative impact on the ecological stability and provides significant competition to the wild ungulates for food.

5.3.1.2 Policy Objectives

1. To rehabilitate degraded Tsamdro to enhance fodder production and promote fodder sustainability within SWS.
2. To encourage the local community to rear productive improved breeds of cattle to reduce impact on limited pasture land.

5.3.1.3 Implementation: Actions and Guidelines

1. Initiate the leasing of reverted Tsamdro/pasture land to communities of Merak and Sakteng.
2. Identify degraded leased Tsamdro and acquire user consensus to initiate silvopasture development.
3. Conduct grazing carrying capacity study and bring degraded rangeland under scientific management purview.
4. Rehabilitate degraded leased pasture land/rangeland through planting fodder trees, bamboo species and suitable grass species for improved fodder production.
5. In collaboration with DoL, supply of improved breed cattle will be initiated on pilot basis to reduce free forest grazing and increase diary production.
6. Initiate stall feeding and supply fodder trees to intensify on-farm cattle management and offset fodder shortages.
7. Initiate agroforestry on pilot basis in the leased pasture land to offset fodder shortages and intensify on-farm cattle management

5.3.2 Human-Wildlife Conflict – Crop Depredation

5.3.2.1 Rationale

Maize is the main cereal crop grown in the lower part of the Sanctuary. Settlements are interspersed often by forested areas making it easy for the wild animal to raid crops. Because of the limited land holdings, even slight incidences of crop depredation cause serious problems of food insecurity to the community residing inside SWS. Wild Pig, Porcupine, Monkey and Asiatic Black Bear are the problematic wild animals that raid crops at regular intervals in addition to domestic animals.

The issue of human-wildlife conflict in the form of crop loss is gaining top priority at the national level. The loss of crops to wild animals is considerably high despite sleepless nights being spent guarding crops. Often strong conservation policy gets blamed by the rural farmers.

Nevertheless, appropriate management interventions will not only help the local community to increase food self-sufficiency but also ensure a resilient farming community who would steward our biodiversity and species conservation.

5.3.2.2 Policy Objectives

1. To minimize human-wildlife conflict to improve food security and decrease criticism of conservation efforts.
2. To consolidate conservation landscapes within the core and multiple use zones of the Sanctuary and promote species conservation through active involvement of local people and engagement of relevant stakeholders.

5.3.2.3 Implementation: Actions and Guidelines

1. In collaboration with Dzongkhag Agriculture Sector, identify suitable sites for installation of electric/solar and alarm fencing of the agriculture land on pilot basis.
2. Provide training on installation of electric/solar and alarm fencing to the local community.
3. Pilot crop insurance schemes in worst affected areas by organizing consultative stakeholder workshop involving all relevant stakeholders. Form groups and define by-laws and governance mechanisms to verify claims.
4. Where feasible, the SWS should source funding to provide seed money for such insurance schemes.
5. Conduct a feasibility study to grow additional crops with maize in collaboration with the agriculture sector.
6. Initiate pilot horticulture farming for sustainable production of agricultural products to meet food self-sufficiency.
7. Upscale the horticultural farming initiatives to rest of the communities inside the Sanctuary by engaging donors and actively sourcing the required funds.
8. Supply high yielding varieties of crops, fruit trees and vegetable seeds.
9. Supply polyhouses to high altitude community for growing vegetables.
10. Conduct ecological study of the problematic species to develop appropriate strategy and action plans.

5.3.3 Human-Wildlife Conflict – Livestock Depredation

5.3.3.1 Rationale

Protected areas are the cornerstone of biodiversity conservation and ecosystem management. PAs in Bhutan are considered very unique with people residing inside the core zone of parks and Wildlife Sanctuaries. The concept of PA management in Bhutan is supposedly derived from the Buddhist philosophy of living in harmony with nature ensuring mutual benefits in perpetuity. Esteem reverence to animal by people can be drawn from statues and many paintings engraved on walls of monasteries all across the country.

Over the time, the commencement of payment of financial compensation for livestock kill by few wild animals have jeopardized the long built reverence and harmonized coexistence

concept in the Bhutanese society. Now, people have become less tolerant to livestock attack made by wild predators. Often the wild predators get killed in retaliatory responses.

Because of the grazing regime adopted by local people and their constant interaction with nature, the chances of human-wildlife conflict are exceedingly high. Prevalence of livestock kill by wild animals is enormous but people seldom report the case in absence of compensation schemes.

5.3.3.2 Policy Objectives

1. To ensure the harmonized coexistence of species and local community through minimization of human-wildlife conflicts.
2. To develop a suitable strategy and action plan to reduce human-wildlife conflict and enhance species conservation support from the local community.
3. To explore and support livestock product diversification, packaging and marketing to enhance income generation.
4. To build community appreciation of wildlife and biodiversity through sustained environmental education programs.

5.3.3.3 Implementation: Actions and Guidelines

1. Assess the seriousness of human-wildlife conflict in all the villages and species involved in livestock depredation.
2. Initiate pilot strategies to mitigate livestock depredation.
3. Initiate livestock insurance schemes in worst affected areas. Form village livestock insurance committee and define by-laws and governance mechanisms to verify claims.
4. Provide training on kill identification and verification in the field.
5. Where feasible, SWS should source funding to provide seed money for such insurance schemes.
6. Upscale successful initiatives by engaging donors and actively sourcing the required funds.
7. Conduct ecological study of problematic species to develop appropriate strategy and action plans.
8. Support the formation of livestock cooperatives, product development and packaging.
9. Provide training on livestock product development and packaging.
10. Upscale SMART patrolling with well-equipped hardware, software and equipment.
11. Construct check points at strategic locations.

5.3.4 Preservation and Promotion of Culture and Traditions

5.3.4.1 Rationale

Preservation and promotion of culture and traditions is one of the important pillars of Gross National Happiness. The strong upholding of rich culture and traditions by the Bhutanese so far has helped the kingdom of Bhutan maintain its sovereignty. Many foreigners visit Bhutan just to witness the unique culture and traditions of the Bhutanese society.

The unique culture and historical importance of the Brokpa community is described in Herdman's dilemma by Karma Ura (1999). Because of its breathtaking landscape and unique culture, SWS was proposed as a mixed world heritage site. It is one of the PAs in Bhutan that made it to the tentative list of UNESCO world heritage sites in 2013. Brokpas are distinct from the rest of the Bhutanese because of their unique costumes consists of (male) *Namcho yutangproe* (turquoise earrings), *Tshokha chuba* (red/black wool jacket), *Paktsa* (animals hide wear above *Tshokha chuba*), *Khupthen* (round woollen piece dangles from belt), *Kangho* (woollen half pant), *Pishup* (leather trousers) and *Pulham* (leather boots). Female dress is called *Shingka* (cotton gown), *Todung* (cotton shirt), *Lhemba* (woollen raincoat), *Meykem* (woollen cloth dangling below abdomen in back) and *Tshemlham* (boots made of leather and wool). The most distinctive part of the *Brokpa* outfit, however, is the unique *Tsetpu zham* (felt hat with five fingers like projections). These costumes are made from animal hides, sheep and yak wool. PAs are not only responsible for landscape and species conservation but also entrusted to promote the preservation of culture and traditions of the local community. With the advent of modern facilities and cheap alternatives to traditional costumes, the unique culture of Brokpas is increasingly under threat. Therefore, we propose a number of activities gearing towards promotion of their unique culture and heritage that can be achieved in the next few years.

5.3.4.2 Policy Objectives

1. Promote local culture and traditions through providing support to restore important cultural and religious sites.
2. Ensure the promotion of traditional aesthetics of villages under SWS to encourage increased ecotourism.
3. Revive and stimulate the production of homemade costumes through increased wool production.

5.3.4.3 Implementation: Actions and Guidelines

1. Assessment and mapping of important cultural and religious sites within SWS.
2. Documentation of local culture, folk tales and traditional knowledge in collaboration with local community and concerned authorities.
3. Support restoration of important cultural and religious sites by actively sourcing funds from potential donors.
4. Conduct awareness to local communities on the importance of preservation and promotion of traditional Bhutanese architect.
5. Carry out shingle/shinglep roofing over CGI sheet to restore the traditional aesthetic of the Merak and Sakteng villages.
6. Pilot the shingle/shinglep treatment with appropriate wood preservatives to enhance its durability.
7. Upscale the shingle/shinglep treatment initiatives to both the villages of Merak and Sakteng on cost sharing basis.
8. Actively source funds to support the supply of sheep and improved yak breeds for wool production.

9. Support a feral dog control program in collaboration with relevant stakeholders.
10. Identify site for construction of a Nature, Culture and Historical Museum to document and promote unique cultural and traditional heritage of the local community.
11. Support the construction of a Nature, Culture and Historical Museum by sourcing adequate funds.

5.3.5 Meeting Resource Needs Sustainably and Promote Conservation Stewardship

5.3.5.1 Rationale

Estimates of 5000 people live in 772 households in 13 villages of two Gewogs within the Sanctuary. These communities are predominantly semi-pastoralists and depend on the forest resources for food and energy. Only a few communities residing in the lower altitude practice subsistence farming owing to shortage of landholdings. Non-wood forest products such as *Paris polyphylla*, *Aconitum* spp., *Rhododendron* spp., *Swertia chirata*, *Gentiana* spp., Mushroom and Bamboo help to supplement their diet and incomes. Further, almost 37.5% of the total area is open pasture land and almost 75% of the total area is accessible to grazing. There is a need to ensure that forests and landscapes therein are utilized on a sustainable level.

Apart from significant demand of timber and firewood from the community within the Sanctuary, the demand for such products has also been steadily increasing from the adjoining communities.

5.3.5.2 Policy Objectives

1. Ensure and enhance access to natural resources for the rural communities inside the Sanctuary in a sustainable manner without harm to the health and integrity of ecosystem.
2. Ensure sustainable utilization of forest resources to guarantee a functional landscape for wild species.
3. Ensure the national goal of maintaining 60% forest cover for all times while resources needs of the local community are met.
4. Lobby and promote conservation stewardship in the mind-set of the community through active involvement in livelihood enhancement initiatives.

5.3.5.3 Implementation: Actions and Guidelines

1. Assessment and mapping of timber and non-timber resources availability within SWS for developing sustainable utilization plan.
2. Conduct timber resource inventory and develop local forest management plan for the buffer and multiple use zones.
3. Explore appropriate wood treatment technology and initiate the wood treatment to increase wood durability.
4. Initiate solar water heating system for cooking and warming the houses.
5. Explore and pilot the biogas production for cooking.

6. Explore and initiate the wood briquette production on pilot basis for cooking and heating to reduce the fuel wood consumption.
7. Supply improved heating and cooking stove in conjunction with wood briquette.
8. Liaise, discuss and plan bi-annually with adjacent Divisional Forest Office on resource allocation sites and agree on resource allocation responsibilities and timetables.
9. Explore demand and availability of medicinal and aromatic plant (MAP) species in collaboration with the Institute of Traditional Medicine Services (ITMS).
10. Conduct awareness programs to educate local community on the harvesting methods and guidelines of NWFPs.
11. Support the formation of NWFP management groups to reduce illegal harvesting of NWFPs and promote its sustainability.
12. Rigorously promote NWFP-based and cottage industries through providing appropriate training on processing and packaging. Communities will be trained on making range of unique handicraft products from locally available materials and innovative marketing strategies will be developed.
13. Streamline marketing of NWFPs that are not consumed within Bhutan in coordination with relevant stakeholders.
14. Evaluate and revise an existing NWFP and community forestry management plan that is due for expiration in 2019.
15. Provide alternative cooking and heating equipment (electric pressure cookers& improved heating stoves) to schools and religious institutions to reduce pressure on forest resources.
16. Initiate Environmental Stewardship Award to recognize individuals or community for their extraordinary contribution towards conservation. Award will be bestowed based on developed criteria.

5.3.6 Promote Ecotourism and Recreation

5.3.6.1 Rationale

Bhutan is a much aspired destination to many affluent foreigners because of widely accepted environmental leadership, pristine ecosystem, unique cultural heritage and biodiversity hotspots. The majority of tourists visit Bhutan to witness cultural diversity and festivals. Only a handful of tourists come for nature based tourism to enjoy the unique landscapes, pristine ecosystem and species diversity. This is mainly because of poor packaging and marketing in regards to wildlife and nature based tourism by the tour operators.

Presence of spectacular beauty and fascinating wild flora and fauna makes the Pas, some of the finest destinations for tourists. Culturally significant sites and unique local communities add to this potential. Promoting this will not only help diversification of services offered by Bhutan's tourism sectors but also help distribute income from tourist to communities within and around PAs.

There is also increasing understanding of the need to make PAs in Bhutan self-sustaining in the long run. Charging nominal usage fees from tourists for availing facilities and services inside the PAs will contribute towards fulfilling this objective.

There is growing enthusiasm among the affluent and middle class Bhutanese to visit unexplored places for recreation. Such an initiative from the Sanctuary will also ensure the recreation requirements of these growing enthusiasts.

5.3.6.2 Policy Objectives

1. Provide high quality and innovative nature and community based tourist packages within the Sanctuary to diversify the services offered by Bhutan's tourism industry.
2. Contribute to the preservation and promotion of culturally and ecologically significant sites.
3. Contribute to enhancement of community and income through implementation of attractive tourist packages.

5.3.6.3 Implementation: Actions and Guidelines

1. Identify and institutionalize one local festival each for two Gewogs and package it into tourism products to be sold annually.
2. Conduct feasibility study for development of birding facility, hiking and biking trails and other adventurous tours.
3. Develop roughly 35 km of biking -cum- trekking trails connecting Merak and Sakteng via Nyakchungla pass.
4. Develop biking -cum-eco trail around the village of Merak and Sakteng for the visitors.
5. Develop ecological garden nearby the settlement of Merak and Sakteng and an amusement park with rhododendron garden at Sheteymi.
6. Develop at least three birding and hiking trails within the SWS to promote nature based ecotourism.
7. Construct one Ecological and Biodiversity Educational Hub within SWS to promote environmental and species conservation education and awareness.
8. Provide support to organize annual festivals, biking and trekking cross country for first three years after the operation.
9. Install signage (at least 25) at every entry points for visitors' awareness and education.
10. Maintenance of existing trails and campsites with modern amenities will be developed to cater to the increasing visitors.
11. While developing campsites, low cost climate smart structures will be considered to showcase and create awareness to local communities on the importance of building climate resilient structures.
12. Initiate the introduction of snow trout into the high altitude lakes of SWS to explore the possibility of high end fishing.

13. Possibility of skiing, paragliding and high end fishing will be explored for affluent tourists visiting the country. Separate packages for this high end amusement travel will be developed based on the pilot experiences along with required infrastructures at the site.
14. Where feasible, treks and other tourist packages will be managed by the communities. For this, agreements and strong actionable by-laws will be drawn and developed for smooth functioning.
15. Trails and campsites handed to the local communities will have to be maintained by the community from the accumulated fees and benefits.
16. Campsites and other infrastructures (other than those managed by communities) will be regulated, maintained and managed by the SWS authority.
17. Climate smart sanitary facility with modern amenities will be developed along the trails and at the campsites.
18. Develop sauna facility at Merak and Sakteng for visitors as well for local communities.
19. The Sanctuarestaff will monitor all trekking routes, biking trails and camping sites on regular basis to ensure rules compliance.
20. Garbage pits for organic waste will be constructed along trekking routes, biking trails and campsites but non-biodegradable waste should be carried out of the Sanctuary.

5.3.7 Ensuring Species Persistence

5.3.7.1 Rationale

The sole objective of declaring any protected area is to ensure species persistence in the landscape. However, the conservation should not override people's livelihood sustenance. An understanding of species, socio-economic conditions and landscapes along with threats from poachers and other factors should support strategies aimed at ensuring species survival.

5.3.7.2 Policy Objectives

1. Ensure species survival by maintaining ecological integrity and landscape productivity with vibrant support from local community.
2. Develop effective conservation strategy and action plans based on strong scientific database and complete understanding of species ecology.
3. Generate strong conservation support from local community through vigorous conservation education and developing citizen scientist by actively involving community in the species research.

5.3.7.3 Implementation: Actions and Guidelines

1. An ambitious research program will be initiated with the aim to understand species, landscapes and threats to conservation. The result of the research will be used for further refinement of zonation of the Sanctuary to define appropriate management intervention.

2. For the next ten years, we will focus our species research on:
 - a. Takin
 - b. Royal Bengal Tiger
 - c. Red Panda
 - d. Musk Deer
 - e. Blyth's Tragopan
 - f. Wild Dog
 - g. Himalayan Black Bear
3. Further, we will also conduct research on following tree species to understand their ecology and ensure sustainability within the Sanctuary.
 - a. *Pinus roxburghii*
 - b. *Pinus bhutanica*
 - c. *Quercus semecarpifolia*
 - d. *Picea spinulosa*
 - e. *Michelia* spp
 - f. *Taxus baccata*
4. Research on small mammal, herpetofauna, butterfly and fresh water biodiversity
5. Habitat management such as creation of salt licks and waters holes, restoration of alpine lakes and ponds, restocking of alpine grasslands by clearing rhododendron bushes, and ecological thinning in the core zones will be carried out.
6. Suitable fruit bearing tree species, bamboo species and banana species will be planted in the core zones and multiple use zones to improve the food availability for wild ungulates and avifauna.
7. Conduct regular forest fire awareness campaign and creation of fire lines in the fire risk areas.
8. Revision of zones and designation of special protection zones in the Sanctuary will be carried out based on the research results for effective management interventions.
9. Quantification of ecosystem services provided by conservation landscapes and the impact of climate change on such services.
10. Regular patrols will be conducted with improved technology (SMART patrolling) to curb the poaching of species.
11. Initiate Zero poaching programs (capacity development and strategy development for implementation).
12. Regular environmental education programmes will be carried out in the schools, religious institutions and communities within the Sanctuary.
13. Actively support nature clubs in the schools to conduct environmental education to students and communities.

5.3.8 Soil and Water Conservation

5.3.8.1 Rationale

Soil and water is vital for ecological and landscape productivity. Owing to fragile geological formation and steep slope, soil erosion and massive siltation along seasonal and perennial streams is a common feature in majority of the Sanctuary area. Further, continuous grazing and frequent migration of large herds of cattle adds severity to landslides and soil erosion. This has resulted in loss of already constrained grazing land and worsening of pasture quality especially in the alpine areas.

5.3.8.2 Policy Objectives

1. Minimize and reclaim eroded gullies through appropriate soil and water conservation interventions for sustained landscape productivity.
2. Ensure continuous water supply for local community and white water for hydropower generation to enhance livelihoods and income generation.

5.3.8.3 Implementation: Actions and Guidelines

1. Designate and declare critically degraded areas as special protection zones for certain period of time to regain its ecological vitality.
2. Construct check dams and carry out plantations in the severely eroded and landslide areas.
3. Carry out water source protection plantation and restrict people from harvesting forest resources in and around the water sources.
4. Assess critically eroded and landslide areas to understand the factors contributing to such degradation.
5. Conduct studies on the land management regimes to select and promote best practices.
6. Initiate payment for ecosystem services (PES) to upstream settlements from the settlements and upcoming hydropower projects in the downstream.

5.3.9 Ensuring Climate Resilient Community

5.3.9.1 Rationale

Extreme climatic condition fuelled by global warming is one of the major threats to food security and cause of poverty, diseases and migration. Communities of Merak and Sakteng will be worst affected, should the impact of extreme climate change be felt in Bhutan. The majority of the residents depend on livestock farming. Very small portions of the community practice sustenance farming and have very limited knowledge of climate change and adaptation resources. Hence, preparedness of local people to the climate change phenomenon is absolutely necessary to avoid extreme effects of climate disasters.

5.3.9.2 Policy Objectives

1. Develop climate resilient community through education and implementation of climate adaptative practices.
2. Ensure food security by engaging the community in alternative livelihood opportunities.

5.3.9.3 Implementation: Actions and Guidelines

1. Conduct climate change vulnerability assessment in the settlements in and around the SWS.
2. Conduct perception study on climate change and its causes and impact.
3. Conduct awareness education on the climate change and its impact and factors contributing to global warming.
4. Establish permanent monitoring plot and carry out regular monitoring to understand the climate change.
5. Support the formation of water user groups to promote community co-operation and dynamism.
6. Assess the quantity of solid waste and type of waste produced within the SWS.
7. Conduct awareness education on the negative effects of solid waste on surrounding environment and wild animal species in the forest.
8. Construction of garbage bins and waste dumping sites in all the villages under the SWS.
9. Conduct regular cleaning campaigns involving communities and schools.
10. Draw agreements and by-laws with local communities for proper management of waste in the area.
11. Support for ensuring good hygiene in the villages in collaboration with health sector.

5.3.10 Institutional Strengthening and Services Delivery

5.3.10.1 Rationale

We place high importance on institutional strengthening on the premise that institution needs to be vibrant, self-sustaining and responsive to emerging challenges. People working in the institution must be competent, proactive and motivated to ensure effective service delivery. The need for continuous human resources development is pivotal in ensuring resilient institutions and dynamic implementation of conservation programs.

Additionally, the lessons learned from the implementation of past programs has educated that human resources are critical to ensure successful implementation of any conservation programs. While formulating the present management plan it has been realised that the protected area managers are in better position to plan for their area. Thus, we bestow maximum emphasize on capacity building of the staff. Furthermore, we have recognized the importance of proper, reliable and well maintained database as prerequisites for the formulation of appropriate policies and strategies.

5.3.10.2 Policy Objectives

1. Ensure sustained institutional development to provide maximum conservation impacts and deliver effective public services.
2. Develop adequate infrastructure and mobility facilities to ensure species protection and equitable resource allocation.
3. Ensure high quality research and information dissemination to develop action oriented strategy and plans.
4. Ensure sustained human resources development to champion the conservation by embracing newer challenges and technologies.

5.3.10.3 Implementation: Actions and Guidelines

1. Issuance of timber permits and marking of trees must be done within shorter time frame to ease the burden for the public. All range offices should ensure the strict compliance to Government to Citizen (G2C) services guidelines in delivering public services.
2. Periodic analysis of services provided by given number of forest personnel over a specific time frame should be conducted to rationalize the staff requirement and deployment.
3. A comprehensive human resources development plan will be proposed for endorsement by DoFPS to ensure availability of highly trained and motivated staff.
4. A comprehensive Geographical Information System (GIS) based on a spatial information system will be developed to monitor land allotment and forest cover loss.
5. Field staff should be provided with adequate facilities in terms of housing, field gears, mobility and capacity building opportunities to ensure motivation and output maximization.
6. Initiate Environmental Stewardship Award for extraordinary performers within the office annually. Criteria for selection of recipients will be developed and implemented.
7. A quarterly staff meeting should be convened to discuss pertinent issues and strategies to improve the management of the Sanctuary.

Chapter VI: Financial Projection

Total fund projection for the plan period is Nu. 496,960,000.00 (Ngultrum four hundred ninety six million nine hundred sixty thousand). 48.21% of the total projected fund is to meet the recurrent expenses and 51.79% is proposed for capital expenses (Table 7). Recurrent expenses estimated under RGoB funding should be included in the yearly budget requisition to the Government. The recurrent cost have been calculated based on the number of staff approved by RCSC and yearly budget allocation endorsed by the RGoB.

The Sanctuary management have to source 51.79% (Nu. 257.36 million) of the projected fund from potential donors to implement proposed conservation programs to achieve the set vision and objectives of the plan. Therefore, strategic projects must be developed for potential donors based on common thematic areas addressing key conservation issues.

Table 7: Abstract of projected fund

Management Intervention	Yearly Work Plan and Financial Projection										Total
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
Program 1: Rehabilitate degraded Tsamdro and enhance livestock productivity	2.50	2.60	2.60	0.60	0.50	0.10	0.10	2.00	2.00	0.00	13.00
Program 2: Reduce crop depreations	0.15	1.30	3.70	3.05	3.50	3.58	0.00	0.10	0.00	0.10	15.48
Program 3: Alleviate Livestock Depredation and retaliatory killing	0.00	0.20	3.80	5.20	5.00	1.05	0.00	0.05	0.00	0.05	15.35
Program 4: Promote local culture and tradition	0.90	2.80	3.35	1.00	0.00	0.05	2.00	2.00	0.00	0.00	12.10
Program 5: Meeting Resource Needs Sustainably and Promote Conservation Stewardship	1.71	3.22	2.73	1.14	1.75	0.66	0.67	0.08	0.89	0.10	12.95
Program 6: Promote Ecotourism through showcasing local culture and tradition	0.15	7.67	8.69	9.13	10.97	9.91	2.15	4.69	4.23	2.27	59.86
Program 7: Ensuring Species Persistence	2.57	4.13	6.54	6.26	4.72	4.31	4.57	4.96	7.11	5.82	50.99
Program 8: Management of Soil and Water Erosion	0.00	0.10	1.05	2.60	2.30	0.00	0.35	0.05	0.37	0.10	6.92

Program 9: Ensuring Climate Resilient Community	0.90	3.00	3.92	1.29	0.36	0.36	0.45	0.45	0.59	0.54	11.86
Program 10: Institutional Strengthening and Services Delivery	19.21	22.53	30.77	27.25	35.51	25.61	38.57	30.88	30.33	37.79	298.45
Total	28.09	47.55	67.15	57.52	64.61	45.63	48.86	45.26	45.52	46.77	496.96

Chapter VII: Monitoring and Review

Monitoring and evaluation is a yardstick for measuring success of proposed program/activities at any stage and at the end of a project. It will provide guidance and feedback on project coherency and deliverables. The purpose of this is to identify whether the plan is being implemented effectively and the objectives are being met. Where implementation runs into problems, monitoring and review can be used to re-deploy resources and effort to improve implementation.

Further, a successful monitoring program will set standards and benchmarks for maintaining and assessing the health of the PAs. In natural resource management, monitoring is a critical component of an informed process for making decisions and to know the state of the PA before deciding on the appropriate course of action. The METT developed by the World Congress on Protected Areas-International Union for Conservation for Nature (WCPA-IUCN) to evaluate PAs has been recognized by global community. Accordingly, Bhutan has adopted the tool with minor modification in the assessing protocol and renamed as Bhutan METT plus.

Bhutan METT plus is now a holistic approach to evaluate management effectiveness of PAs corresponding to its objectives. A logical framework for monitoring and review of the management plan implementation is prepared and attached as annexure (Annexure 10).

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Annexure 1: Checklist of plant species of SWS

Sl#	Scientific Name	Family	Sl#	Scientific Name	Family
1	<i>Abelmoschus manihot</i>	Malvaceae	29	<i>Allium semenovii</i>	Alliaceae
2	<i>Abies densa</i>	Pinaceae	30	<i>Alnus nepalensis</i>	Betulaceae
3	<i>Acanthocalyx nepalensis</i>	Morinaceae	31	<i>Anaphalis busua</i>	Compositae
4	<i>Acer acuminatum</i>	Aceraceae	32	<i>Anaphalis contorta</i>	Compositae
5	<i>Acer campbellii</i>	Aceraceae	33	<i>Anaphalis margaritacea</i>	Compositae
6	<i>Acer cappadocicum</i>	Aceraceae	34	<i>Anaphalis nepalensis</i>	Compositae
7	<i>Acer caudatum</i>	Aceraceae	35	<i>Anaphalis triplinervis</i>	Compositae
8	<i>Acer hookeri</i>	Aceraceae	36	<i>Anaphalis vivipara</i>	Compositae
9	<i>Acer oblongum</i>	Aceraceae	37	<i>Androcorys josephi</i>	Orchidaceae
10	<i>Acer pectinatum</i>	Aceraceae	38	<i>Androcorys monophyllum</i>	Orchidaceae
11	<i>Achyranthes aspera</i>	Amaranthaceae	39	<i>Anemone obtusiloba</i>	Ranunculaceae
12	<i>Aconitum hookeri</i>	Ranunculaceae	40	<i>Anemone rivularis</i>	Ranunculaceae
13	<i>Aconitum orochryseum</i>	Ranunculaceae	41	<i>Anemone trullifolia</i>	Ranunculaceae
14	<i>Aconitum patulum</i>	Ranunculaceae	42	<i>Anemone vitifolia</i>	Ranunculaceae
15	<i>Aconogonon campanulatum</i>	Polygonaceae	43	<i>Angelica cyclocarpa</i>	Umbelliferae
16	<i>Aconogonon molle</i>	Polygonaceae	44	<i>Anoectochilus brevilabris</i>	Orchidaceae
17	<i>Aconogonon tortuosum</i>	Polygonaceae	45	<i>Anthogonium gracile</i>	Orchidaceae
18	<i>Adenia trilobata</i>	Passifloraceae	46	<i>Aorchis spathulata</i>	Orchidaceae
19	<i>Adenophora khasiana</i>	Campanulaceae	47	<i>Ardisia macrocarpa</i>	Myrsinaceae
20	<i>Aeschynanthus sikkimensis</i>	Gesneriaceae	48	<i>Arenaria bryophylla</i>	Cryophyllaceae
21	<i>Agapetes serpens</i>	Ericaceae	49	<i>Arenaria densissima</i>	Cryophyllaceae
22	<i>Ageratina adenophora</i>	Compositae	50	<i>Arisaema consanguineum</i>	Araceae
23	<i>Agrostis sp</i>	Poaceae	51	<i>Arisaema flavum</i>	Araceae
24	<i>Agrostophyllum callosum</i>	Orchidaceae	52	<i>Arisaema griffithii</i>	Araceae
25	<i>Ainsliaea aptera</i>	Mutisieae	53	<i>Arisaema intermedium</i>	Araceae
26	<i>Alangium chinense</i>	Alangiaceae	54	<i>Arisaema propinquum</i>	Araceae
27	<i>Aletris pauciflora</i>	Melanthiaceae	55	<i>Arisaema tortuosum</i>	Araceae
28	<i>Allium carolinianum</i>	Alliaceae	56	<i>Aristolochia griffithii</i>	Aristolochiaceae

57	<i>Aristolochia tagala</i>	Aristolochiaceae	87	<i>Bergenia purpurascens</i>	Saxifragaceae
58	<i>Artemisia</i> sp	Compositae	88	<i>Bergenia</i> sp	Saxifragaceae
59	<i>Artemisia vulgaris</i>	Compositae	89	<i>Bergenia stracheyi</i>	Saxifragaceae
60	<i>Arthraxon quartinianus</i>	Poaceae	90	<i>Betula alnoides</i>	Betulaceae
61	<i>Arundina graminifolia</i>	Orchidaceae	91	<i>Betula utilis</i>	Betulaceae
62	<i>Arundinaria</i> sp	Poaceae	92	<i>Bidens pilosa</i>	Compositae
63	<i>Aster ageratoides</i>	Compositae	93	<i>Bistorta affinis</i>	Polygonaceae
64	<i>Aster albescens</i>	Compositae	94	<i>Bistorta amplexicaulis</i>	Polygonaceae
65	<i>Aster diplosteghioides</i>	Compositae	95	<i>Bistorta macrophylla</i>	Polygonaceae
66	<i>Astilbe</i> sp	Saxifragaceae	96	<i>Bistorta milletii</i>	Polygonaceae
67	<i>Astragalus</i> sp	Leguminosae	97	<i>Bistorta vacciniifolia</i>	Polygonaceae
68	<i>Avena fatua</i>	Poaceae	98	<i>Bistorta vivipara</i>	Polygonaceae
69	<i>Axonopus compressus</i>	Poaceae	99	<i>Boehmeria platyphylla</i>	Urticaceae
70	Bamboo (Maling)	Poaceae	100	<i>Boehmeria macrophylla</i>	Urticaceae
71	Bamboo (muree -local)	Poaceae	101	<i>Colocasia</i> sp	Araceae
72	<i>Barbarea intermedia</i>	Cruciferae	102	<i>Borang pan (brokpa)</i>	Piperaceae
73	<i>Barbarea vulgaris</i>	Cruciferae	103	<i>Borinda grossa</i>	Poaceae
74	<i>Drynaria</i> spp	Polypodiaceae	104	<i>Brassaiopsis miits</i>	Araliaceae
75	<i>Bauhinia variegata</i>	Leguminosae	105	<i>Brugmansia suaveolens</i>	Solanaceae
76	<i>Begonia</i> sp	Begoniaceae	106	<i>Buddleja asiatica</i>	Buddlejaceae
77	<i>Benthamedia capitata</i>	Cornaceae	107	<i>Buddleja colvilei</i>	Buddlejaceae
78	<i>Berberis angulosa</i>	Berberidaceae	108	<i>Buddleja crispa</i>	Buddlejaceae
79	<i>Berberis aristata</i>	Berberidaceae	109	<i>Bulbophyllum affine</i>	Orchidaceae
80	<i>Berberis griffithiana</i>	Berberidaceae	110	<i>Bulbophyllum cornu-cervi</i>	Orchidaceae
81	<i>Berberis koreana</i>	Berberidaceae	111	<i>Bulbophyllum cylindraceum</i>	Orchidaceae
82	<i>Berberis lambertii</i>	Berberidaceae	112	<i>Bulbophyllum depressum</i>	Orchidaceae
83	<i>Berberis praecipua</i>	Berberidaceae	113	<i>Bulbophyllum emarginatum</i>	Orchidaceae
84	<i>Berberis regia</i>	Berberidaceae	114	<i>Bulbophyllum griffithii</i>	Orchidaceae
85	<i>Berberis vulgaris</i>	Berberidaceae	115	<i>Bulbophyllum gymnopus</i>	Orchidaceae
86	<i>Berberis wallichiana</i>	Berberidaceae	116	<i>Bulbophyllum hirtum</i>	Orchidaceae

117	<i>Bulbophyllum obrienianum</i>	Orchidaceae	147	<i>Cheirostylis griffithii</i>	Orchidaceae
118	<i>Bulbophyllum odoratissimum</i>	Orchidaceae	148	<i>Chimonobambusa callosa</i>	Poaceae
119	<i>Bulbophyllum reptans</i>	Orchidaceae	149	<i>Chirita urticifolia</i>	Gesneriaceae
120	<i>Bulbophyllum retusiusculum</i>	Orchidaceae	150	<i>Chromolaena odorata</i>	Compositae
121	<i>Bulbophyllum secundum</i>	Orchidaceae	151	<i>Chrysoglossum ornatum</i>	Orchidaceae
122	<i>Bulbophyllum</i> spp.	Orchidaceae	152	<i>Chrysozplenium carnosum</i>	Saxifragaceae
123	<i>Bulbophyllum umbellatum</i>	Orchidaceae	153	<i>Chrysozplenium nepalense</i>	Saxifragaceae
124	<i>Caesalpinia decapetala</i>	Leguminosae	154	<i>Chusua pauciflora</i>	Orchidaceae
125	<i>Calamagrotis</i> sp	Poaceae	155	<i>Cinnamomum</i> sp	Lauraceae
126	<i>Calanthe keshabii</i>	Orchidaceae	156	<i>Cinnamomum tamala</i>	Lauraceae
127	<i>Calanthe mannii</i>	Orchidaceae	157	<i>Cirsium eriophorooides</i>	Compositae
128	<i>Calanthe plantaginea</i>	Orchidaceae	158	<i>Cirsium falconeri</i>	Compositae
129	<i>Caltha palustris</i>	Ranunculaceae	159	<i>Cirsium souliei</i>	Compositae
130	<i>Caltha scaposa</i>	Ranunculaceae	160	<i>Cleisostoma linearilobulatum</i>	Orchidaceae
131	<i>Cannabis sativa</i>	Malvaceae	161	<i>Cleisostoma racemiferum</i>	Orchidaceae
132	<i>Cardamine griffithii</i>	Cruciferae	162	<i>Cleisostoma williamsonii</i>	Orchidaceae
133	<i>Cardamine macrophylla</i>	Cruciferae	163	<i>Clematis acutangula</i>	Ranunculaceae
134	<i>Cardocrinum giganteum</i>	Liliaceae	164	<i>Clematis barbellata</i>	Ranunculaceae
135	<i>Carex duthiei</i>	Cypraceae	165	<i>Clematis buchananiana</i>	Ranunculaceae
136	<i>Cassia occidentalis</i>	Leguminosae	166	<i>Clematis montana</i>	Ranunculaceae
137	<i>Cassiope fastigata</i>	Ericaceae	167	<i>Clematis tongluensis</i>	Ranunculaceae
138	<i>Castanopsis hystrix</i>	Fagaceae	168	<i>Clintonia udensis</i>	Uvulariaceae
139	<i>Castanopsis purpurella</i>	Fagaceae	169	<i>Codonopsis</i> sp	Campanulaceae
140	<i>Castanopsis tribuloides</i>	Fagaceae	170	<i>Coelogyne corymbosa</i>	Orchidaceae
141	<i>Cautleya spicata</i>	Zingiberaceae	171	<i>Coelogyne occultata</i>	Orchidaceae
142	<i>Celtis tetrandra</i>	Ulmaceae	172	<i>Coelogyne ovalis</i>	Orchidaceae
143	<i>Cephalanthera damasonium</i>	Orchidaceae	173	<i>Coelogyne prolifera</i>	Orchidaceae
144	<i>Cerastium</i> sp	Caryophyllaceae	174	<i>Coelogyne raizadae</i>	Orchidaceae
145	<i>Ceratosylis himalaica</i>	Orchidaceae	175	<i>Coelogyne schultesii</i>	Orchidaceae
146	<i>Ceropegia</i> sp	Asclepiadaceae	176	<i>Colebrookea oppositifolia</i>	Labiatae

177	<i>Colocasia</i> sp	Araceae	207	<i>Cymbidium lancifolium</i>	Orchidaceae
178	<i>Colquhounia coccinea</i>	Labiatae	208	<i>Cynoglossum furcatum</i>	Boraginaceae
179	<i>Combretum wallichii</i>	Combretaceae	209	<i>Cynoglossum spp</i>	Boraginaceae
180	<i>Commelina maculata</i>	Commelinaceae	210	<i>Cyperus difformis</i>	Cyperaceae
181	<i>Conchidium muscicola</i>	Orchidaceae	211	<i>Cyperus rotundus (grass)</i>	Cyperaceae
182	<i>Conchidium pusillum</i>	Orchidaceae	212	<i>Cyperus sp (grass)</i>	Cyperaceae
183	<i>Coniogramme pubescens</i>	Pteridaceae	213	<i>Cypripedium sp</i>	Orchidaceae
184	<i>Coriaria nepalensis</i>	Coriariaceae	214	<i>Dactyloctenium aegyptium</i>	Orchidaceae
185	<i>Cortella hookeri</i>	Umbelliferae	215	<i>Daphne holua</i>	Thymelaeaceae
186	<i>Corydalis polygalina</i>	Fumariaceae	216	<i>Daphne retusa</i>	Thymelaeaceae
187	<i>Corydalis</i> sp	Fumariaceae	217	<i>Daphne sureil</i>	Thymelaeaceae
188	<i>Corydalis thyrsoiflora</i>	Fumariaceae	218	<i>Daphniphyllum himalense</i>	Daphniphyllaceae
189	<i>Corylus ferox</i>	Betulaceae	219	<i>Datura stramonium</i>	Solanaceae
190	<i>Cotoneaster microphyllus</i>	Rosaceae	220	<i>Debregeasia longifolia</i>	Urticaceae
191	<i>Crawfordia</i> sp	Gentianaceae	221	<i>Delphinium brunonianum</i>	Ranunculaceae
192	<i>Cremanthodium oblongatum</i>	Compositae	222	<i>Delphinium spp</i>	Ranunculaceae
193	<i>Cremanthodium</i> sp	Compositae	223	<i>Dendrobium aphyllum</i>	Orchidaceae
194	<i>Crepidium acuminatum</i>	Orchidaceae	224	<i>Dendrobium candidum</i>	Orchidaceae
195	<i>Crotalaria occulta</i>	Leguminosae	225	<i>Dendrobium chrysanthum</i>	Orchidaceae
196	<i>Crotons</i> sp	Euphorbiaceae	226	<i>Dendrobium densiflorum</i>	Orchidaceae
197	<i>Cupressus corneyana</i>	Cupressaceae	227	<i>Dendrobium falconeri</i>	Orchidaceae
198	<i>Cuscuta</i> sp	Cuscutaceae	228	<i>Dendrobium fimbriatum</i>	Orchidaceae
199	<i>Cyananthus incanus</i>	Campanulaceae	229	<i>Dendrobium hookerianum</i>	Orchidaceae
200	<i>Cyananthus lobatus</i>	Campanulaceae	230	<i>Dendrobium longicornu</i>	Orchidaceae
201	<i>Cyanotis vaga</i>	Commelinaceae	231	<i>Dendrobium nobile</i>	Orchidaceae
202	<i>Cymbidium bicolor</i>	Orchidaceae	232	<i>Dendrobium porphyrochilum</i>	Orchidaceae
203	<i>Cymbidium elegans</i>	Orchidaceae	233	<i>Dendrobium transparens</i>	Orchidaceae
204	<i>Cymbidium erythraeum</i>	Orchidaceae	234	<i>Desmodium elegans</i>	Leguminosae
205	<i>Cymbidium hookerianum</i>	Orchidaceae	235	<i>Desmodium sp</i>	Leguminosae
206	<i>Cymbidium iridoides</i>	Orchidaceae	236	<i>Deutzia compacta</i>	Philadelphaceae

237	<i>Dichroa febrifuga</i>	Hydrangeaceae	267	<i>Equisetum diffusum</i>	Equisetaceae
238	<i>Digitaria sp</i>	Poaceae	268	<i>Eria carinata</i>	Orchidaceae
239	<i>Dioscorea bulbifera</i>	Dioscoreaceae	269	<i>Eria coronaria</i>	Orchidaceae
240	<i>Diplazium esculentum</i>	Arthuriaceae	270	<i>Erigeron multiradiatus</i>	Compositae
241	<i>Dipsacus inermis</i>	Dipsacaceae	271	<i>Erigeron sp</i>	Compositae
242	<i>Disporum cantoniense</i>	Uvulariaceae	272	<i>Erythrina arborescens</i>	Leguminosae
243	<i>Dracocephalum nutans</i>	Labiatae	273	<i>Erythrina stricta</i>	Leguminosae
244	<i>Drosera peltata</i>	Droseraceae	274	<i>Esmeralda clarkii</i>	Orchidaceae
245	<i>Dryopteris arguta</i>	Dryopteridaceae	275	<i>Euphorbia griffithii</i>	Euphorbiaceae
246	<i>Dryopteris sp</i>	Dryopteridaceae	276	<i>Euphorbia pulcherrima</i>	Euphorbiaceae
247	<i>Dubyaea hispida</i>	Compositae	277	<i>Euphorbia sikkimensis</i>	Euphorbiaceae
248	<i>Duchesnea indica</i>	Rosaceae	278	<i>Eurya acuminata</i>	Theaceae
249	<i>Echinochloa colona</i>	Poaceae	279	<i>Eurya cerasifolia</i>	Theaceae
250	<i>Edgeworthia gardneri</i>	Thymelaeaceae	280	<i>Eurya japonica</i>	Theaceae
251	<i>Elaeagnus infundibularis</i>	Elaeagnaceae	281	<i>Eurya serrata</i>	Theaceae
252	<i>Elaeagnus parvifolia</i>	Elaeagnaceae	282	<i>Eutrema primulifolium</i>	Cruciferae
253	<i>Elaeocarpus sphaericus</i>	Elaeocarpaceae	283	<i>Exbucklandia populnea</i>	Hamamelidaceae
254	<i>Elatostema platyphyllum</i>	Urticaceae	284	<i>Fagopyrum sp</i>	Polygonaceae
255	<i>Elatostema sessile</i>	Urticaceae	285	<i>Festuca sp</i>	Poaceae
256	<i>Elsholtzia fruticosa</i>	Labiatae	286	<i>Ficus auriculata</i>	Moraceae
257	<i>Elsholtzia sp</i>	Labiatae	287	<i>Ficus neriifolia</i>	Moraceae
258	<i>Elsholtzia strobilifera</i>	Labiatae	288	<i>Ficus semicordata</i>	Moraceae
259	<i>Embelia sp</i>	Myrsinaceae	289	<i>Ficus sp</i>	Moraceae
260	<i>Engelhardia spicata</i>	Juglandaceae	290	<i>Fragaria daltoniana</i>	Rosaceae
261	<i>Enkianthus deflexus</i>	Ericaceae	291	<i>Fragaria nubicola</i>	Rosaceae
262	<i>Ephedra Gerardiana</i>	Ephedraceae	292	<i>Fragaria vesca</i>	Rosaceae
263	<i>Epigenium fargesii</i>	Orchidaceae	293	<i>Fritillaria delavayi</i>	Liliaceae
264	<i>Epigenium fuscescens</i>	Orchidaceae	294	<i>Galeola lindleyana</i>	Orchidaceae
265	<i>Epilobium royleanum</i>	Onagraceae	295	<i>Galinsoga ciliata</i>	Compositae
266	<i>Epipogium roseum</i>	Orchidaceae	296	<i>Galinsoga parviflora</i>	Compositae

297	<i>Galium affine</i>	Rubiaceae	327	<i>Girardinia diversifolia</i>	Urticaceae
298	<i>Galium rotundifolium</i>	Rubiaceae	328	<i>Girardinia palmate</i>	Urticaceae
299	<i>Gamblea ciliate</i>	Araliaceae	329	<i>Gnaphalium affine</i>	Compositae
300	<i>Gastrochilus calceolaris</i>	Orchidaceae	330	<i>Gnaphalium</i> sp	Compositae
301	<i>Gastrochilus distichus</i>	Orchidaceae	331	<i>Gonatanthus pumilus</i>	Araceae
302	<i>Gaultheria fragrantissima</i>	Ericaceae	332	<i>Goodyera fusca</i>	Orchidaceae
303	<i>Gaultheria griffithiana</i>	Ericaceae	333	<i>Goodyera repens</i>	Orchidaceae
304	<i>Gaultheria pyroloides</i>	Ericaceae	334	<i>Goodyera schlehtendaliana</i>	Orchidaceae
305	<i>Gaultheria trichophylla</i>	Ericaceae	335	<i>Goodyera viridiflora</i>	Orchidaceae
306	<i>Gentiana algida</i>	Gentianaceae	336	<i>Grewia optiva</i>	Tiliaceae
307	<i>Gentiana capitata</i>	Gentianaceae	337	<i>Gymnadenia orchidis</i>	Orchidaceae
308	<i>Gentiana carinata</i>	Gentianaceae	338	<i>Habenaria arietina</i>	Orchidaceae
309	<i>Gentiana depressa</i>	Gentianaceae	339	<i>Habenaria marginata</i>	Orchidaceae
310	<i>Gentiana ehwesii</i>	Gentianaceae	340	<i>Hackelia uncinata</i>	Boraginaceae
311	<i>Gentiana emodi</i>	Gentianaceae	341	<i>Halenia elliptica</i>	Gentianaceae
312	<i>Gentiana ornate</i>	Gentianaceae	342	<i>Hedera helix</i>	Araliaceae
313	<i>Gentiana urnula</i>	Gentianaceae	343	<i>Hedera nepalensis</i>	Araliaceae
314	<i>Gentiana veitchiorum</i>	Gentianaceae	344	<i>Hedychium ellipticum</i>	Zingiberaceae
315	<i>Gentiana waltonii</i>	Gentianaceae	345	<i>Hedychium gardnerianum</i>	Zingiberaceae
316	<i>Geranium donianum</i>	Geraniaceae	346	<i>Hedychium spicatum</i>	Zingiberaceae
317	<i>Geranium nakaoanum</i>	Geraniaceae	347	<i>Helwingia himalaica</i>	Cornaceae
318	<i>Geranium nepalense</i>	Geraniaceae	348	<i>Hemiphragma heterophyllum</i>	Scrophulariaceae
319	<i>Geranium polyanthes</i>	Geraniaceae	349	<i>Hemiphragma</i> sp	Scrophulariaceae
320	<i>Geranium pratense</i>	Geraniaceae	350	<i>Heracleum lalli</i>	Umbelliferae
321	<i>Geranium procurrens</i>	Geraniaceae	351	<i>Heracleum nepalense</i>	Umbelliferae
322	<i>Geranium sp</i>	Geraniaceae	352	<i>Heracleum obtusifolium</i>	Umbelliferae
323	<i>Geranium wallichianum</i>	Geraniaceae	353	<i>Heracleum wallichii</i>	Umbelliferae
324	<i>Gesneria sp</i>	Gesneriaceae	354	<i>Herminium lanceum</i>	Orchidaceae
325	<i>Geum elatum</i>	Rosaceae	355	<i>Himalayacalamus falconeri</i>	Poaceae
326	<i>Geum sikkimense</i>	Rosaceae	356	<i>Holboellia latifolia</i>	Lardizabalaceae

357	<i>Holcoglossum himalaicum</i>	Orchidaceae	387	<i>Kyllinga squumulata</i>	Cyperaceae
358	<i>Houttuynia cordata</i>	Saururaceae	388	<i>Larix griffithiana</i>	Pinaceae
359	<i>Hydrangea heteromalla</i>	Hydrangeaceae	389	<i>Lecanthus peduncularis</i>	Urticaceae
360	<i>Hydrocotyle</i> sp	Umbelliferae	390	<i>Leontopodium himalayvanum</i>	Gnaphaliales
361	<i>Hypericum hookerianum</i>	Hypericaceae	391	<i>Leontopodium jacotianum</i>	Gnaphaliales
362	<i>Hypericum japonicum</i>	Hypericaceae	392	<i>Leptodermis lanceolata</i>	Rubiaceae
363	<i>Hypericum</i> sp	Hypericaceae	393	<i>Leptodermis stapfiana</i>	Rubiaceae
364	<i>Ilex diplyrena</i>	Aquifoliaceae	394	<i>Leucas lanata</i>	Labiatae
365	<i>Illicium griffithii</i>	Illiciaceae	395	<i>Leucas</i> sp	Labiatae
366	<i>Impatiens cristata</i>	Balsaminaceae	396	<i>Ligularia amplexicaulis</i>	Compositae
367	<i>Impatiens sulcata</i>	Balsaminaceae	397	<i>Ligularia atkinsonii</i>	Compositae
368	<i>Indigofera</i> sp	Leguminosae	398	<i>Ligularia dentata</i>	Compositae
369	<i>Innula</i> sp	Compositae	399	<i>Ligularia</i> spp.	Compositae
370	<i>Inula cappa</i>	Compositae	400	<i>Lilium nanum</i>	Liliaceae
371	<i>Inula grandiflora</i>	Compositae	401	<i>Lilium</i> spp	Liliaceae
372	<i>Inula hookeri</i>	Compositae	402	<i>Lindera neesiana</i>	Lauraceae
373	<i>Inula racemosa</i>	Compositae	403	<i>Lindera pulcherrima</i>	Lauraceae
374	<i>Ipomoea purpurea</i>	Convolvulaceae	404	<i>Lindera</i> sp	Lauraceae
375	<i>Iris clarkei</i>	Iridaceae	405	<i>Lindernia procumbens</i>	Scrophulariaceae
376	<i>Jasminum grandiflorum</i>	Oleaceae	406	<i>Liparis bootanensis</i>	Orchidaceae
377	<i>Juglans regia</i>	Juglandaceae	407	<i>Liparis cordifolia</i>	Orchidaceae
378	<i>Juncus leucanthus</i>	Juncaceae	408	<i>Liparis nervosa</i> var. <i>khasiana</i>	Orchidaceae
379	<i>Juncus thomsonii</i>	Juncaceae	409	<i>Liparis odorata</i>	Orchidaceae
380	<i>Juniperus communis</i>	Cupressaceae	410	<i>Liparis resupinata</i>	Orchidaceae
381	<i>Juniperus indica</i>	Cupressaceae	411	<i>Lithocarpus elegans</i>	Fagaceae
382	<i>Juniperus pseudosabina</i>	Cupressaceae	412	<i>Lithocarpus</i> sp	Fagaceae
383	<i>Juniperus recurva</i>	Cupressaceae	413	<i>Litsea</i> spp	Lauraceae
384	<i>Juniperus squamata</i>	Cupressaceae	414	<i>Lloydia flavonutans</i>	Liliaceae
385	<i>Jurinea dolomiaea</i>	Compositae	415	<i>Lobelia erectiuscula</i>	Campanulaceae
386	<i>Justicia adhatoda</i>	Acanthaceae	416	<i>Lone</i> sp	Orchidaceae

417	<i>Lonicera purpurascens</i>	Caprifoliaceae	447	<i>Michelia champaca</i>	Magnoliaceae
418	<i>Lonicera quinquelocularis</i>	Caprifoliaceae	448	<i>Michelia doltsopa</i>	Magnoliaceae
419	<i>Luculia gratissima</i>	Rubiaceae	449	<i>Monachosorum henryi</i>	Dennstaedtiaceae
420	<i>Lycopodium</i> sp	Lycopodiaceae	450	<i>Morina nepalensis</i>	Morinaceae
421	<i>Lyonia ovalifolia</i>	Ericaceae	451	<i>Morina polyphylla</i>	Morinaceae
422	<i>Lyonia villosa</i>	Ericaceae	452	<i>Morus</i> sp	Moraceae
423	<i>Lysimachia prolifera</i>	Primulaceae	453	<i>Mulgedium bracteatum</i>	Compositae
424	<i>Macaranga denticulate</i>	Euphorbiaceae	454	<i>Mussaenda roxburghii</i>	Rubiaceae
425	<i>Macaranga indica</i>	Euphorbiaceae	455	<i>Mycaranthes floribunda</i>	Orchidaceae
426	<i>Maesa chisia</i>	Myrsinaceae	456	<i>Myriactis wallichii</i>	Compositae
427	<i>Magnolia campbellii</i>	Magnoliaceae	457	<i>Myrica esculenta</i>	Myricaceae
428	<i>Magnolia globosa</i>	Magnoliaceae	458	<i>Myricaria rosea</i>	Tamaricaceae
429	<i>Magnolia</i> sp	Magnoliaceae	459	<i>Nardostachys grandiflora</i>	Valerianaceae
430	<i>Mahonia napaulensis</i>	Berberidaceae	460	<i>Nasturtium officinale</i>	Cruciferae
431	<i>Maianthemum oleraceum</i> var.	Convallariaceae	461	<i>Nasturtium</i> sp	Cruciferae
432	<i>Malaxis muscifera</i>	Orchidaceae	462	<i>Neillia rubiflora</i>	Rosaceae
433	<i>Mallotus philippensis</i>	Euphorbiaceae	463	<i>Neogyna gardneriana</i>	Orchidaceae
434	<i>Malus baccata</i>	Rosaceae	464	<i>Neopicrorhiza scrophulariiflora</i>	Scrophulariaceae
435	<i>Mazus delavayi</i>	Scrophulariaceae	465	<i>Neottia acuminata(orchid)</i>	Orchidaceae
436	<i>Mazus pumilus</i>	Scrophulariaceae	466	<i>Neottia listeroides</i>	Orchidaceae
437	<i>Mazus surculosus</i>	Scrophulariaceae	467	<i>Neottia pinetorum</i>	Orchidaceae
438	<i>Meconopsis bella</i>	Papavaraceae	468	<i>Nepeta laevigata</i>	Labiatae
439	<i>Meconopsis grandis</i>	Papavaraceae	469	<i>Nephrolepis cordifolia</i>	Lomariopsidaceae
440	<i>Meconopsis horridula</i>	Papavaraceae	470	<i>Nervilia falcata</i>	Orchidaceae
441	<i>Meconopsis nepalensis</i>	Papavaraceae	471	<i>Notholirion thomsonianum</i>	Liliaceae
442	<i>Meconopsis paniculata</i>	Papavaraceae	472	<i>Nyssa javanica</i>	Nyssaceae
443	<i>Meconopsis simplicifolia</i>	Papavaraceae	473	<i>Oberonia acaulis</i>	Orchidaceae
444	<i>Meconopsis villosa</i>	Papavaraceae	474	<i>Oberonia falcata</i>	Orchidaceae
445	<i>Megacodon stylophorus</i>	Gentianaceae	475	<i>Odontochilus lanceolatus</i>	Orchidaceae
446	<i>Mentha</i> sp	Labiatae	476	<i>Odontochilus poilanei</i>	Orchidaceae

477	<i>Oleandra pistillaris</i>	Oleandraceae	507	<i>Pedicularis megalantha</i>	Scrophulariaceae
478	<i>Omphalogramma</i>	Primulaceae	508	<i>Pedicularis oliveriana</i>	Scrophulariaceae
479	<i>Onopordum acanthium</i>	Compositae	509	<i>Pedicularis scullyana</i>	Scrophulariaceae
480	<i>Onosma hookeri</i>	Boraginaceae	510	<i>Pedicularis siphonantha</i>	Scrophulariaceae
481	<i>Oreorchis foliosa</i> var. <i>Foliosa</i>	Orchidaceae	511	<i>Pedicularis</i> sp	Scrophulariaceae
482	<i>Oreosolen wattii</i>	Scrophulariaceae	512	<i>Pennisetum elandestinum</i>	Poaceae
483	<i>Oreosolen williamsii</i>	Scrophulariaceae	513	<i>Persea clarkeana</i>	Lauraceae
484	<i>Ornithochilus difformis</i>	Orchidaceae	514	<i>Persea odoratissima</i>	Lauraceae
485	<i>Orabanchae sp</i>	Orabanchaceae	515	<i>Persicaria capitata</i>	Polygonaceae
486	<i>Osbeckia nepalensis</i>	Melastomataceae	516	<i>Persicaria humilis</i>	Polygonaceae
487	<i>Osmanthus suavis</i>	Oleaceae	517	<i>Persicaria nepalensis</i>	Polygonaceae
488	<i>Otochilus fuscus</i>	Orchidaceae	518	<i>Persicaria polystachya</i>	Polygonaceae
489	<i>Otochilus lancilabius</i>	Orchidaceae	519	<i>Persicaria runcinata</i>	Polygonaceae
490	<i>Oxalis acetosella</i>	Oxalidaceae	520	<i>Persicaria</i> sp (runner)	Polygonaceae
491	<i>Oxalis</i> sp	Oxalidaceae	521	<i>Petasites tricholobus</i>	Compositae
492	<i>Oxygraphis endlicheri</i>	Ranunculaceae	522	<i>Phalaenopsis taenialis</i>	Orchidaceae
493	<i>Oxyria digyna</i>	Polygonaceae	523	<i>Philadelphus tomentosus</i>	Philadelphaceae
494	<i>Oxyspora paniculata</i>	Melastomataceae	524	<i>Phlomis bracteosa</i>	Labiatae
495	<i>Panax pseudo-ginseng</i>	Araliaceae	525	<i>Phlomis breviflora</i>	Labiatae
496	<i>Papilionanthe vandarum</i>	Orchidaceae	526	<i>Phlomis rotata</i>	Labiatae
497	<i>Paris polyphylla</i>	Trilliaceae	527	<i>Phlomis tibetica</i>	Labiatae
498	<i>Parnassia delavayi</i>	Parnassiaceae	528	<i>Pholidota articulata</i>	Orchidaceae
499	<i>Parnassia nubicola</i>	Parnassiaceae	529	<i>Pholidota pallida</i>	Orchidaceae
500	<i>Parochetus communis</i>	Leguminosae	530	<i>Phreatia elegans</i>	Orchidaceae
501	<i>Paspalum distichum</i>	Poaceae	531	<i>Phytolacca acinosa</i>	Phytolaccaceae
502	<i>Paspalum spp</i>	Poaceae	532	<i>Picea spinulosa</i>	Pinaceae
503	<i>Pedicularis siphonantha</i>	Scrophulariaceae	533	<i>Pieris formosa</i>	Ericaceae
504	<i>Pedicularis cornigera</i>	Scrophulariaceae	534	<i>Pilea scripta</i>	Urticaceae
505	<i>Pedicularis longiflora</i>	Scrophulariaceae	535	<i>Pilea umbrosa</i>	Urticaceae
506	<i>Pedicularis longissima</i>	Scrophulariaceae	536	<i>Pinalia amica</i>	Orchidaceae

537	<i>Pinalia graminifolia</i>	Orchidaceae	567	<i>Polygonum chinense</i>	Polygonaceae
538	<i>Pinalia spicata</i>	Orchidaceae	568	<i>Polygonum convolvulus</i>	Polygonaceae
539	<i>Pinus bhutanica</i>	Pinaceae	569	<i>Polygonum molle</i>	Polygonaceae
540	<i>Pinus roxburghii</i>	Pinaceae	570	<i>Polygonum nepalense</i>	Polygonaceae
541	<i>Piper sp</i>	Piperaceae	571	<i>Polygonum strigosum</i>	Polygonaceae
542	<i>Piptanthus nepalensis</i>	Leguminosae	572	<i>Polygonum vivipara</i>	Polygonaceae
543	<i>Pitiosporum napaulense</i>	Pittosporaceae	573	<i>Polystichum sp</i>	Dryopteridaceae
544	<i>Plantago depressa</i>	Plantaginaceae	574	<i>Populus ciliata</i>	Salicaceae
545	<i>Plantago major</i>	Plantaginaceae	575	<i>Potentilla anserina</i>	Rosaceae
546	<i>Plantago sp</i>	Plantaginaceae	576	<i>Potentilla arbuscula</i>	Rosaceae
547	<i>Platanthera bakeriana</i>	Orchidaceae	577	<i>Potentilla coriandrifolia</i>	Rosaceae
548	<i>Platanthera clavigera</i>	Orchidaceae	578	<i>Potentilla cuneata</i>	Rosaceae
549	<i>Platanthera dyeriana</i>	Orchidaceae	579	<i>Potentilla eriocarpa</i>	Rosaceae
550	<i>Platanthera edgeworthii</i>	Orchidaceae	580	<i>Potentilla fulgens</i>	Rosaceae
551	<i>Platanthera sikkimensis</i>	Orchidaceae	581	<i>Potentilla griffithii</i>	Rosaceae
552	<i>Platanthera urceolata</i>	Orchidaceae	582	<i>Potentilla microphylla</i>	Rosaceae
553	<i>Platystemma voiloides</i>	Gesneriaceae	583	<i>Potentilla peduncularis</i>	Rosaceae
554	<i>Plectocomia himalayana</i>	Arecaceae	584	<i>Potentilla plurijuga</i>	Rosaceae
555	<i>Pleione hookeriana</i>	Orchidaceae	585	<i>Pouzolzia sp</i>	Urticaceae
556	<i>Pleione humilis</i>	Orchidaceae	586	<i>Primula buryana</i>	Primulaceae
557	<i>Pleurospermum amabile</i>	Umbelliferae	587	<i>Primula calderiana</i>	Primulaceae
558	<i>Poa sp</i>	Poaceae	588	<i>Primula caveana</i>	Primulaceae
559	<i>Podophyllum hexandrum var. chinensis</i>	Podophyllaceae	589	<i>Primula denticulata</i>	Primulaceae
560	<i>Podophyllum hexandrum</i>	Podophyllaceae	590	<i>Primula edgeworthii</i>	Primulaceae
561	<i>Podophyllum sikkimense</i>	Podophyllaceae	591	<i>Primula glabra</i>	Primulaceae
562	<i>Polygala arillata</i>	Polygalaceae	592	<i>Primula glomerata</i>	Primulaceae
563	<i>Polygonatum hookeri</i>	Convallariaceae	593	<i>Primula gracilipes</i>	Primulaceae
564	<i>Polygonatum kansuense</i>	Convallariaceae	594	<i>Primula griffithii</i>	Primulaceae
565	<i>Polygonatum multiflorum</i>	Convallariaceae	595	<i>Primula involucreta</i>	Primulaceae
566	<i>Polygonatum amplexicaule</i>	Polygonaceae	596	<i>Primula irregularis</i>	Primulaceae

597	<i>Primula macrophylla</i>	Primulaceae	627	<i>Quercus semecarpifolia</i>	Fagaceae
598	<i>Primula microphylla</i>	Primulaceae	628	<i>Rabdosia rugosa</i>	Lamiaceae
599	<i>Primula minuta</i>	Primulaceae	629	<i>Ranunculus brotherusii</i>	Ranunculaceae
600	<i>Primula potaninii</i>	Primulaceae	630	<i>Ranunculus chinensis</i>	Ranunculaceae
601	<i>Primula primulina</i>	Primulaceae	631	<i>Ranunculus hirtellus</i>	Ranunculaceae
602	<i>Primula reidii</i>	Primulaceae	632	<i>Remusatia hookeriana</i>	Araceae
603	<i>Primula reptans</i>	Primulaceae	633	<i>Rhaphidophora decursiva</i>	Araceae
604	<i>Primula sikkimensis</i>	Primulaceae	634	<i>Rhaphidophora glauca</i>	Araceae
605	<i>Primula stuartii</i>	Primulaceae	635	<i>Rheum acuminatum</i>	Polygonaceae
606	<i>Primula uniflora</i>	Primulaceae	636	<i>Rheum australe</i>	Polygonaceae
607	<i>Primula wollastonii</i>	Primulaceae	637	<i>Rhodiola crenulata</i>	Crassulaceae
608	<i>Prunella vulgaris</i>	Labiatae	638	<i>Rhodiola heterodonta</i>	Crassulaceae
609	<i>Prunus cerasoides</i>	Rosaceae	639	<i>Rhodiola himalensis</i>	Crassulaceae
610	<i>Prunus</i> sp	Rosaceae	640	<i>Rhododendron aeruginosum</i>	Ericaceae
611	<i>Brassaiopsis mitis</i>	Araliaceae	641	<i>Rhododendron anthopogon</i>	Ericaceae
612	<i>Psuedomortensia</i> sp	Scrophulariaceae	642	<i>Rhododendron arboreum</i>	Ericaceae
613	<i>Pteridium aquilinum</i>	Dennstaedtiaceae	643	<i>Rhododendron argipeplum</i>	Ericaceae
614	<i>Pteridium</i> sp	Dennstaedtiaceae	644	<i>Rhododendron barbatum</i>	Ericaceae
615	<i>Pteris quadriaurita</i>	Pteridaceae	645	<i>Rhododendron bhutanense</i>	Ericaceae
616	<i>Pterocephalodes hookeri</i>	Dipsacaceae	646	<i>Rhododendron camelliiflorum</i>	Ericaceae
617	<i>Ptilotus</i> sp	Amaranthaceae	647	<i>Rhododendron campanulatum</i>	Ericaceae
618	<i>Pycnoplinthopsis bhutanica</i>	Cruciferae	648	<i>Rhododendron campylocarpum</i>	Ericaceae
619	<i>Pyrola bicolori</i>	Pyrolaceae	649	<i>Rhododendron ciliatum</i>	Ericaceae
620	<i>Pyrrosia boothii</i>	Polyodiaceae	650	<i>Rhododendron cinnabarinum</i>	Ericaceae
621	<i>Pyrrosia</i> sp	Polyodiaceae	651	<i>Rhododendron dalhousiae</i>	Ericaceae
622	<i>Pyrus</i> sp	Rosaceae	652	<i>Rhododendron dalhousiae</i> var.	Ericaceae
623	<i>Quercus glauca</i>	Fagaceae	653	<i>Rhododendron edgeworthii</i>	Ericaceae
624	<i>Quercus griffithii</i>	Fagaceae	654	<i>Rhododendron falconeri</i>	Ericaceae
625	<i>Quercus lamellose</i>	Fagaceae	655	<i>Rhododendron flinckii</i>	Ericaceae
626	<i>Quercus lanata</i>	Fagaceae	656	<i>Rhododendron fulgens</i>	Ericaceae

657	<i>Rhododendron glaucophyllum</i>	Ericaceae	687	<i>Ribes griffithii</i>	Grossulariaceae
658	<i>Rhododendron grande</i>	Ericaceae	688	<i>Ribes laciniatum</i>	Grossulariaceae
659	<i>Rhododendron griffithianum</i>	Ericaceae	689	<i>Ribes orientale</i>	Grossulariaceae
660	<i>Rhododendron hodgsonii</i>	Ericaceae	690	<i>Ribes takare</i>	Grossulariaceae
661	<i>Rhododendron kendrickii</i>	Ericaceae	691	<i>Ricinus communis</i>	Euphorbiaceae
662	<i>Rhododendron kesangiae</i>	Ericaceae	692	<i>Rosa brunonii</i>	Rosaceae
663	<i>Rhododendron keyssii</i>	Ericaceae	693	<i>Rosa macrophylla</i>	Rosaceae
664	<i>Rhododendron lanatum</i>	Ericaceae	694	<i>Rosa sericea</i>	Rosaceae
665	<i>Rhododendron leptidotum</i>	Ericaceae	695	<i>Roscoea alpina</i>	Zingiberaceae
666	<i>Rhododendron leptocarpum</i>	Ericaceae	696	<i>Roscoea auriculata</i>	Zingiberaceae
667	<i>Rhododendron lindleyi</i>	Ericaceae	697	<i>Roscoea purpurea</i>	Zingiberaceae
668	<i>Rhododendron maddenii</i>	Ericaceae	698	<i>Rubia cordifolia</i>	Rubiaceae
669	<i>Rhododendron neriiflorum</i>	Ericaceae	699	<i>Rubia manjith</i>	Rubiaceae
670	<i>Rhododendron nivale</i>	Ericaceae	700	<i>Rubus acuminatus</i>	Rosaceae
671	<i>Rhododendron niveum</i>	Ericaceae	701	<i>Rubus biflorus</i>	Rosaceae
672	<i>Rhododendron papillatum</i>	Ericaceae	702	<i>Rubus ellipticus</i>	Rosaceae
673	<i>Rhododendron pendulum</i>	Ericaceae	703	<i>Rubus fragarioides</i>	Rosaceae
674	<i>Rhododendron setosum</i>	Ericaceae	704	<i>Rubus hoffmeiterianus</i>	Rosaceae
675	<i>Rhododendron succothii</i>	Ericaceae	705	<i>Rubus hypargyris</i>	Rosaceae
676	<i>Rhododendron thomsonii</i>	Ericaceae	706	<i>Rubus indotibetanus</i>	Rosaceae
677	<i>Rhododendron triflorum</i>	Ericaceae	707	<i>Rubus nepalensis</i>	Rosaceae
678	<i>Rhododendron tsariense</i>	Ericaceae	708	<i>Rubus paniculatus</i>	Rosaceae
679	<i>Rhododendron virgatum</i>	Ericaceae	709	<i>Rubus splendidiissimus</i>	Rosaceae
680	<i>Rhododendron wallichii</i>	Ericaceae	710	<i>Rumex nepalensis</i>	Polygonaceae
681	<i>Rhododendron wightii</i>	Ericaceae	711	<i>Rumex patientia</i>	Polygonaceae
682	<i>Rhus chinensis</i>	Anacardiaceae	712	<i>Salix babylonica</i>	Salicaceae
683	<i>Rhus hookeri</i>	Anacardiaceae	713	<i>Salix calyculata</i>	Salicaceae
684	<i>Rhus paniculata</i>	Anacardiaceae	714	<i>Salix serpyllum</i>	Salicaceae
685	<i>Rhus succedanea</i>	Anacardiaceae	715	<i>Salix sikkimensis</i>	Salicaceae
686	<i>Ribes glaciale</i>	Grossulariaceae	716	<i>Salix wallichii</i>	Salicaceae

717	<i>Salvia nubicola</i>	Labiatae	747	<i>Senecio diversifolius</i>	Compositae
718	<i>Sambucus adnata</i>	Caprifoliaceae	748	<i>Senecio laetus</i>	Compositae
719	<i>Sapium insigne</i>	Euphorbiaceae	749	<i>Senecio scandens</i>	Compositae
720	<i>Sarcococca wallichii</i>	Buxaceae	750	<i>Senecio wallichii</i>	Compositae
721	<i>Satyrium nepalense</i>	Orchidaceae	751	<i>Sibbaldia</i> sp	Rosaceae
722	<i>Satyrium nepalense</i> var. <i>Ciliatum</i>	Orchidaceae	752	<i>Silene nigrescens</i>	Caryophyllaceae
723	<i>Saurauja napaulensis</i>	Actinidiaceae	753	<i>Smilacina oleracea</i>	Liliaceae
724	<i>Saussurea atkinsonii</i>	Compositae	754	<i>Smilacina purpurea</i>	Liliaceae
725	<i>Saussurea gossypiphora</i>	Compositae	755	<i>Smilax orthoptera</i>	Smilacaceae
726	<i>Saussurea graminifolia</i>	Compositae	756	<i>Smilax</i> sp	Smilacaceae
727	<i>Saussurea obvallata</i>	Compositae	757	<i>solanum</i> sp (similar to <i>S.nigrum</i>)	Solanaceae
728	<i>Saussurea roylei</i>	Compositae	758	<i>Solanum verbascifolium</i>	Solanaceae
729	<i>Saussurea simpsoniana</i>	Compositae	759	<i>Solanum viarium Dunal</i>	Solanaceae
730	<i>Saussurea sughoo</i>	Compositae	760	<i>Sonchus asper</i>	Compositae
731	<i>Saussurea tridactyla</i>	Compositae	761	<i>Sorbus cuspidata</i>	Rosaceae
732	<i>Saxifraga parnassifolia</i>	Saxifragaceae	762	<i>Sorbus foliolosa</i>	Rosaceae
733	<i>Saxifraga pulvinaria</i>	Saxifragaceae	763	<i>Sorbus microphylla</i>	Rosaceae
734	<i>Schefflera impressa</i>	Araliaceae	764	<i>Sorbus tibetanus</i>	Rosaceae
735	<i>Schefflera</i> sp	Araliaceae	765	<i>Sorbus wallichii</i>	Rosaceae
736	<i>Schima khasiana</i>	Theaceae	766	<i>Soroseris hookeriana</i>	Compositae
737	<i>Schima wallichii</i>	Theaceae	767	<i>Spathoglottis ixioides</i>	Orchidaceae
738	<i>Schoenoplectus juncooides</i>	Cyperaceae	768	<i>Spermacoce</i> sp	Rubiaceae
739	<i>Schoenorchis gemmata</i>	Orchidaceae	769	<i>Spiraea arcuata</i>	Rosaceae
740	<i>Scrophularia</i> sp	Scrophulariaceae	770	<i>Spiraea bella</i>	Rosaceae
741	<i>Scutellaria scandens</i>	Lamiaceae	771	<i>Spiraea canescens</i>	Rosaceae
742	<i>Selaginella</i> sp	Selaginellaceae	772	<i>Spiraea scandens</i>	Rosaceae
743	<i>Selinum</i> sp	Umbelliferae	773	<i>Spiranthes sinensis</i>	Orchidaceae
744	<i>Selinum tenuifolium</i>	Umbelliferae	774	<i>Stachys melissaefolia</i>	Labiatae
745	<i>Selinum wallichianum</i>	Umbelliferae	775	<i>Stachys tibetica</i>	Labiatae
746	<i>Senecio chrysanthemoides</i>	Compositae	776	<i>Stellaria</i> sp	Caryophyllaceae

777	<i>Stellaria vestita</i>	Caryophyllaceae	807	<i>Taraxacum mitalli</i>	Compositae
778	<i>Stellera chamaejasme</i>	Rutaceae	808	<i>Taxus baccata</i>	Taxaceae
779	<i>Stephania glabra</i>	Menispermaceae	809	<i>Tectaria polymorpha</i>	Tectariaceae
780	<i>Sterculia villosa</i>	Sterculiaceae	810	<i>Tectaria</i> sp	Tectariaceae
781	<i>Stereochilus hirtus</i>	Orchidaceae	811	<i>Terminallia</i> spp.	Combretaceae
782	<i>Stipa</i> sp	Poaceae	812	<i>Tetragtigma</i> sp	Vitaceae
783	<i>Streptopus simplex</i>	Uvulariaceae	813	<i>Thalictrum</i> sp	Ranunculaceae
784	<i>Streptopus</i> sp	Uvulariaceae	814	<i>Thamnocalamus</i> sp	Poaceae
785	<i>Strobilanthes atropurpureus</i>	Acanthaceae	815	<i>Thladiantha cordifolia</i>	Cucurbitaceae
786	<i>Strobilanthes</i> sp	Acanthaceae	816	<i>Toona ciliata</i>	Meliaceae
787	<i>Sunipia bicolor</i>	Orchidaceae	817	<i>Toricellia tiliifolia</i>	Cornaceae
788	<i>Sunipia nepalensis</i>	Orchidaceae	818	<i>Trachydium royle</i>	Apiaceae
789	<i>Swertia bimaculata</i>	Gentianaceae	819	<i>Tricholepis furcata</i>	Compositae
790	<i>Swertia chirata</i>	Gentianaceae	820	<i>Trifolium repens</i>	Leguminosae
791	<i>Swertia cuneata</i>	Gentianaceae	821	<i>Trifolium</i> sp	Leguminosae
792	<i>Swertia hookeri</i>	Gentianaceae	822	<i>Trigonotis</i> sp	Boraginaceae
793	<i>Swertia pseudohookeri</i>	Gentianaceae	823	<i>Tsuga dumosa</i>	Pinaceae
794	<i>Swida macrophylla</i>	Cornaceae	824	<i>Ulmus</i> sp	Ulmaceae
795	<i>Swida</i> sp	Cornaceae	825	<i>Urtica dioica</i>	Urticaceae
796	<i>Symplocos paniculata</i>	Symplocaceae	826	<i>Urtica</i> sp	Urticaceae
797	<i>symplocos racemosa</i>	Symplocaceae	827	<i>Vaccinium nummularia</i>	Ericaceae
798	<i>Symplocos</i> sp	Symplocaceae	828	<i>Vaccinium sikkimense</i>	Ericaceae
799	<i>Syzygium cumini</i>	Myrtaceae	829	<i>Vaccinium</i> spp	Ericaceae
800	<i>Taeniophyllum retrospiculatum</i>	Orchidaceae	830	<i>Valeriana jatamansi</i>	Valerianaceae
801	<i>Tagetes minuta</i>	Compositae	831	<i>Vanda alpine</i>	Orchidaceae
802	<i>Tanacetum gracile</i>	Compositae	832	<i>Vanda bicolor</i>	Orchidaceae
803	<i>Tanacetum nubigenum</i>	Compositae	833	<i>Vanda cristata</i>	Orchidaceae
804	<i>Tanacetum</i> sp	Compositae	834	<i>Vandopsis undulata</i>	Orchidaceae
805	<i>Taraxacum eriopodum</i>	Compositae	835	<i>Verbascum thapsus</i>	Scrophulariaceae
806	<i>Taraxacum</i> sp	Compositae	836	<i>Veronica himalensis</i>	Scrophulariaceae

837	<i>Veronica persica</i>	Scrophulariaceae	848	<i>Woodwardia</i> sp	Blechnaceae
838	<i>Viburnum cotinifolium</i>	Caprifoliaceae	849	<i>Wulfenia</i> sp	Plantaginaceae
839	<i>Viburnum cylindricum</i>	Caprifoliaceae	850	<i>Xanthium indicum</i>	Compositae
840	<i>Viburnum erubescens</i>	Caprifoliaceae	851	<i>Xylosma longifolium</i>	Salicaceae
841	<i>Viburnum mullaha</i>	Caprifoliaceae	852	<i>Youngia depressa</i>	Compositae
842	<i>Viburnum nervosum</i>	Caprifoliaceae	853	<i>Youngia</i> sp	Compositae
843	<i>Viola bhutanica</i>	Violaceae	854	<i>Yushania maling</i>	Poaceae
844	<i>Viola biflora</i>	Violaceae	855	<i>Yushania microphylla</i>	Poaceae
845	<i>Viola diffusa</i>	Violaceae	856	<i>Zanthoxylum spp</i>	Rutaceae
846	<i>Viola wallichiana</i>	Violaceae	857	<i>Zeuxine flava</i>	Orchidaceae
847	<i>Woodfordia fruticosa</i>	Lythraceae	858	<i>Zeuxine goodyeroides</i>	Orchidaceae

Annexure 2: Important Value Index (IVI) of tree species

Sl#	Species	Encounter Nos.	Frequency	Density	Basal Area (m ² /ha)	Relative Frequency	Relative Density	Relative Dominance	IVI	
1	<i>Abies densa</i>	37	458	35.24	0.87	106.283	11.859	26.023	40.188	78.070
2	<i>Tsuga dumosa</i>	16	123	15.24	0.23	59.210	5.128	6.989	22.389	34.506
3	<i>Rhododendron hodgsonii</i>	13	14	12.38	0.27	3.091	4.167	8.068	1.169	13.404
4	<i>Juniperus recurva</i>	12	96	11.43	0.18	8.796	3.846	5.455	3.326	12.627
5	<i>Rhododendron arboretum</i>	11	128	10.48	0.24	3.982	3.526	7.273	1.506	12.304
6	<i>Acer campbellii</i>	10	43	9.52	0.08	11.840	3.205	2.443	4.477	10.125
7	<i>Alnus nepalensis</i>	7	22	6.67	0.04	8.567	2.244	1.250	3.239	6.733
8	<i>Betula utilis</i>	8	21	7.62	0.04	6.860	2.564	1.193	2.594	6.351
9	<i>Juniperus squamata</i>	6	39	5.71	0.07	2.598	1.923	2.216	0.982	5.122
10	<i>Acer sp</i>	9	29	8.57	0.06	1.166	2.885	1.648	0.441	4.973
11	<i>Lyonia ovalifolia</i>	6	41	5.71	0.08	1.518	1.923	2.330	0.574	4.827
12	<i>Rhododendron kesangiae</i>	6	40	5.71	0.08	1.170	1.923	2.273	0.442	4.638
13	<i>Quercus lamellose</i>	3	25	2.86	0.05	5.941	0.962	1.420	2.246	4.628
14	<i>Betula alnoides</i>	4	39	3.81	0.07	2.800	1.282	2.216	1.059	4.557
15	<i>Rhododendron falconeri</i>	5	40	4.76	0.08	1.146	1.603	2.273	0.433	4.309
16	<i>Rhododendron thomsonii</i>	5	41	4.76	0.08	0.600	1.603	2.330	0.227	4.159
17	<i>Quercus glauca</i>	5	23	4.76	0.04	3.017	1.603	1.307	1.141	4.050
18	<i>Sorbus sp</i>	7	25	6.67	0.05	0.803	2.244	1.420	0.304	3.968
19	<i>Larix griffithiana</i>	5	24	4.76	0.05	1.140	1.603	1.364	0.431	3.397
20	<i>Pinus bhutanica</i>	4	18	3.81	0.03	1.660	1.282	1.023	0.628	2.932
21	<i>Persea clarkeana</i>	5	13	4.76	0.02	1.031	1.603	0.739	0.390	2.731
22	<i>Prunus sp</i>	5	10	4.76	0.02	0.810	1.603	0.568	0.306	2.477
23	<i>Symplocos sp</i>	6	7	5.71	0.01	0.260	1.923	0.398	0.098	2.419
24	<i>Rhododendron cinnabarinum</i>	4	18	3.81	0.03	0.259	1.282	1.023	0.098	2.403
25	<i>Persea sp</i>	5	7	4.76	0.01	0.910	1.603	0.398	0.344	2.344

26	<i>Rhododendron lanatum</i>	4	16	3.81	0.03	0.305	1.282	0.909	0.115	2.306
27	<i>Rhododendron wallichii</i>	5	11	4.76	0.02	0.132	1.603	0.625	0.050	2.277
28	<i>Lithocarpus</i> sp	2	3	1.90	0.01	3.778	0.641	0.170	1.429	2.240
29	<i>Quercus griffithii</i>	3	14	2.86	0.03	1.219	0.962	0.795	0.461	2.218
30	<i>Quercus semecarpifolia</i>	1	4	0.95	0.01	4.283	0.321	0.227	1.620	2.167
31	<i>Rhododendron grande</i>	4	12	3.81	0.02	0.500	1.282	0.682	0.189	2.153
32	<i>Lyonia villosa</i>	4	8	3.81	0.02	0.765	1.282	0.455	0.289	2.026
33	<i>Acer acuminatum</i>	3	14	2.86	0.03	0.511	0.962	0.795	0.193	1.950
34	<i>Michelia champaca</i>	2	3	1.90	0.01	2.977	0.641	0.170	1.126	1.937
35	<i>Sorbus mycrophylla</i>	1	22	0.95	0.04	0.560	0.321	1.250	0.212	1.782
36	<i>Quercus lanata</i>	3	9	2.86	0.02	0.750	0.962	0.511	0.284	1.757
37	<i>Rhododendron keysii</i>	4	7	3.81	0.01	0.094	1.282	0.398	0.036	1.715
38	<i>Pinus roxburghii</i>	2	7	1.90	0.01	1.760	0.641	0.398	0.665	1.704
39	<i>Lithocarpus elegans</i>	2	2	1.90	0.00	2.132	0.641	0.114	0.806	1.561
40	<i>Rhododendron barbatum</i>	3	8	2.86	0.015	0.228	0.962	0.455	0.086	1.502
41	<i>Salix sikkimensis</i>	2	13	1.90	0.025	0.283	0.641	0.739	0.107	1.487
42	<i>Eurya serrata</i>	3	7	2.86	0.013	0.101	0.962	0.398	0.038	1.397
43	<i>Eurya</i> sp	3	5	2.86	0.010	0.150	0.962	0.284	0.057	1.302
44	<i>Taxus baccata</i>	2	2	1.90	0.004	1.415	0.641	0.114	0.535	1.290
45	<i>Sorbus wallichii</i>	3	3	2.86	0.006	0.350	0.962	0.170	0.132	1.264
46	<i>symplocos racemosa</i>	1	11	0.95	0.021	0.793	0.321	0.625	0.300	1.245
47	<i>Acer pectinatum</i>	2	2	1.90	0.004	1.005	0.641	0.114	0.380	1.135
48	<i>Rhododendron griffithianum</i>	2	7	1.90	0.013	0.149	0.641	0.398	0.056	1.095
49	<i>Brassaiopsis mitis</i>	2	6	1.90	0.011	0.176	0.641	0.341	0.067	1.049
50	<i>Rhododendron fulgens</i>	2	6	1.90	0.011	0.120	0.641	0.341	0.045	1.027
51	<i>Debregeasia</i> sp	2	5	1.90	0.010	0.249	0.641	0.284	0.094	1.019
52	<i>Rhododendron kindrickii</i>	2	5	1.90	0.010	0.080	0.641	0.284	0.030	0.955
53	<i>Brassaiopsis</i> sp	2	3	1.90	0.006	0.342	0.641	0.170	0.129	0.941
54	<i>Juglans regia</i>	2	2	1.90	0.004	0.300	0.641	0.114	0.113	0.868

55	<i>Cinnamomum</i> sp	2	3	1.90	0.006	0.125	0.641	0.170	0.047	0.859
56	<i>Rhododendron</i> sp	1	7	0.95	0.013	0.365	0.321	0.398	0.138	0.856
57	<i>Rhododendron campylocarpum</i>	2	3	1.90	0.006	0.090	0.641	0.170	0.034	0.846
58	<i>Schefflera impressa</i>	2	2	1.90	0.004	0.080	0.641	0.114	0.030	0.785
59	<i>Hydrangea heteromalla</i>	2	2	1.90	0.004	0.057	0.641	0.114	0.022	0.776
60	<i>Magnolia campbellii</i>	1	2	0.95	0.004	0.556	0.321	0.114	0.210	0.644
61	<i>Pyrus</i> sp	1	2	0.95	0.004	0.507	0.321	0.114	0.192	0.626
62	<i>Viburnum cotinifolium</i>	1	4	0.95	0.008	0.198	0.321	0.227	0.075	0.623
63	<i>Symplocos paniculata</i>	1	4	0.95	0.008	0.145	0.321	0.227	0.055	0.603
64	<i>Ilex</i> sp	1	4	0.95	0.008	0.088	0.321	0.227	0.033	0.581
65	<i>Sorbus foliolosa</i>	1	3	0.95	0.006	0.132	0.321	0.170	0.050	0.541
66	<i>Juniperus pseudosabina</i>	1	3	0.95	0.006	0.065	0.321	0.170	0.025	0.516
67	<i>Schima wallichii</i>	1	2	0.95	0.004	0.209	0.321	0.114	0.079	0.513
68	<i>Morus</i> sp	1	2	0.95	0.004	0.199	0.321	0.114	0.075	0.509
69	<i>Rhododendron wightii</i>	1	3	0.95	0.006	0.040	0.321	0.170	0.015	0.506
70	<i>Enkianthus deflexus</i>	1	3	0.95	0.006	0.038	0.321	0.170	0.014	0.505
71	<i>Litsea</i> sp	1	2	0.95	0.004	0.076	0.321	0.114	0.029	0.463
72	<i>Swida macrophylla</i>	1	2	0.95	0.004	0.040	0.321	0.114	0.015	0.449
73	<i>Marma shing(brokpa)</i>	1	2	0.95	0.004	0.033	0.321	0.114	0.013	0.447
74	<i>Iindera neesiana</i>	1	2	0.95	0.004	0.029	0.321	0.114	0.011	0.445
75	<i>Rhododendron tsariense</i>	1	2	0.95	0.004	0.026	0.321	0.114	0.010	0.444
76	<i>Rhododendron argipeplum</i>	1	2	0.95	0.004	0.025	0.321	0.114	0.009	0.444
77	<i>Betula</i> sp	1	1	0.95	0.002	0.173	0.321	0.057	0.065	0.443
78	<i>Ulmus spp</i>	1	2	0.95	0.004	0.008	0.321	0.114	0.003	0.437
79	<i>Viburnum nervosum</i>	1	1	0.95	0.002	0.096	0.321	0.057	0.036	0.414
80	<i>Myrica esculenta</i>	1	1	0.95	0.002	0.035	0.321	0.057	0.013	0.390
81	<i>Ramshimh</i>	1	1	0.95	0.002	0.019	0.321	0.057	0.007	0.385
82	<i>Pieris tomosa</i>	1	1	0.95	0.002	0.018	0.321	0.057	0.007	0.384

83	<i>Rhododendron campanulatum</i>	1	1	0.95	0.002	0.013	0.321	0.057	0.005	0.382
84	<i>Rhododendron neivium</i>	1	1	0.95	0.002	0.010	0.321	0.057	0.004	0.381
85	<i>Rhus</i> sp	1	1	0.95	0.002	0.01	0.32	0.06	0.00	0.38
Total			1760.00	297.14	3.35	264.47	100.00	100.00	100.00	300.00

Annexure 3: Checklist of Rhododendron Species of SWS

SI #	Scientific Name	SI #	Scientific Name
1	<i>Rhododendron aeruginosum</i>	22	<i>Rhododendron kesangiae</i>
2	<i>Rhododendron anthopogon</i>	23	<i>Rhododendron keysii</i>
3	<i>Rhododendron arboreum</i>	24	<i>Rhododendron lanatum</i>
4	<i>Rhododendron argipeplum</i>	25	<i>Rhododendron lepidotum</i>
5	<i>Rhododendron barbatum</i>	26	<i>Rhododendron leptocarpum</i>
6	<i>Rhododendron bhutanense</i>	27	<i>Rhododendron lindleyi</i>
7	<i>Rhododendron camelliiflorum</i>	28	<i>Rhododendron maddenii</i>
8	<i>Rhododendron campanulatum</i>	29	<i>Rhododendron neriiflorum</i>
9	<i>Rhododendron campylocarpum</i>	30	<i>Rhododendron nivale</i>
10	<i>Rhododendron ciliatum</i>	31	<i>Rhododendron niveum</i>
11	<i>Rhododendron cinnabarinum</i>	32	<i>Rhododendron papillatum</i>
12	<i>Rhododendron dalhousiae</i>	33	<i>Rhododendron pendulum</i>
13	<i>Rhododendron edgeworthii</i>	34	<i>Rhododendron setosum</i>
14	<i>Rhododendron falconeri</i>	35	<i>Rhododendron succothii</i>
15	<i>Rhododendron flinckii</i>	36	<i>Rhododendron thomsonii</i>
16	<i>Rhododendron fulgens</i>	37	<i>Rhododendron triflorum</i>
17	<i>Rhododendron glaucophyllum</i>	38	<i>Rhododendron tsariense</i>
18	<i>Rhododendron grande</i>	39	<i>Rhododendron virgatum</i>
19	<i>Rhododendron griffithianum</i>	40	<i>Rhododendron wallichii</i>
20	<i>Rhododendron hodgsonii</i>	41	<i>Rhododendron wightii</i>
21	<i>Rhododendron kendrickii</i>		

Annexure 4: Checklist of Orchid Species of SWS

SI#	Scientific Name	SI#	Scientific Name	SI#	Scientific Name
1	<i>Agrostophyllum callosum</i>	29	<i>Chrysoglossum ornatum</i>	57	<i>Dendrobium hookerianum</i>
2	<i>Androcorys josephi</i>	30	<i>Chusua pauciflora</i>	58	<i>Dendrobium longicornu</i>
3	<i>Androcorys monophyllum</i>	31	<i>Cleisostoma linearilobulatum</i>	59	<i>Dendrobium nobile</i>
4	<i>Anoectochilus brevilabris</i>	32	<i>Cleisostoma racemiferum</i>	60	<i>Dendrobium porphyrochilum</i>
5	<i>Anthogonium gracile</i>	33	<i>Cleisostoma williamsonii</i>	61	<i>Dendrobium transparens</i>
6	<i>Aorchis spathulata</i>	34	<i>Coelogyne corymbosa</i>	62	<i>Epigenium fargesii</i>
7	<i>Arundina graminifolia</i>	35	<i>Coelogyne occultata</i>	63	<i>Epigenium fuscescens</i>
8	<i>Bulbophyllum affine</i>	36	<i>Coelogyne ovalis</i>	64	<i>Epipogium roseum</i>
9	<i>Bulbophyllum cornu-cervi</i>	37	<i>Coelogyne prolifera</i>	65	<i>Eria carinata</i>
10	<i>Bulbophyllum cylindraceum</i>	38	<i>Coelogyne raizadae</i>	66	<i>Eria coronaria</i>
11	<i>Bulbophyllum depressum</i>	39	<i>Coelogyne schultesii</i>	67	<i>Esmeralda clarkei</i>
12	<i>Bulbophyllum emarginatum</i>	40	<i>Conchidium muscicola</i>	68	<i>Galeola lindleyana</i>
13	<i>Bulbophyllum griffithii</i>	41	<i>Conchidium pusillum</i>	69	<i>Gastrochilus calceolaris</i>
14	<i>Bulbophyllum gymnopus</i>	42	<i>Crepidium acuminatum</i>	70	<i>Gastrochilus distichus</i>
15	<i>Bulbophyllum hirtum</i>	43	<i>Cymbidium bicolor</i>	71	<i>Goodyera fusca</i>
16	<i>Bulbophyllum obrienianum</i>	44	<i>Cymbidium elegans</i>	72	<i>Goodyera repens</i>
17	<i>Bulbophyllum odoratissimum</i>	45	<i>Cymbidium erythraeum</i>	73	<i>Goodyera schlehtendaliana</i>
18	<i>Bulbophyllum reptans</i>	46	<i>Cymbidium hookerianum</i>	74	<i>Goodyera viridiflora</i>
19	<i>Bulbophyllum retusiusculum</i>	47	<i>Cymbidium iridioides</i>	75	<i>Gynmadenia orchidis</i>
20	<i>Bulbophyllum secundum</i>	48	<i>Cymbidium lancifolium</i>	76	<i>Habenaria arietina</i>
21	<i>Bulbophyllum spp.</i>	49	<i>Cyripedium sp</i>	77	<i>Habenaria marginata</i>
22	<i>Bulbophyllum umbellatum</i>	50	<i>Dactylorhiza hatagirea</i>	78	<i>Hermidium lanceum</i>
23	<i>Calanthe keshabii</i>	51	<i>Dendrobium aphyllum</i>	79	<i>Holcoglossum himalaicum</i>
24	<i>Calanthe mannii</i>	52	<i>Dendrobium candidum</i>	80	<i>Liparis bootanensis</i>
				85	<i>Lone sp</i>
				86	<i>Malaxis muscifera</i>
				87	<i>Mycaranthes floribunda</i>
				88	<i>Neogyna gardneriana</i>
				89	<i>Neottia acuminata(orchid)</i>
				90	<i>Neottia listeroides</i>
				91	<i>Neottia pinetorum</i>
				92	<i>Nervilia falcate</i>
				93	<i>Oberonia acaulis</i>
				94	<i>Oberonia falcate</i>
				95	<i>Odontochilus lanceolatus</i>
				96	<i>Odontochilus poilanei</i>
				97	<i>Oreorchis foliosa var. foliosa</i>
				98	<i>Ornithochilus difformis</i>
				99	<i>Otochilus fuscus</i>
				100	<i>Otochilus lancilabius</i>
				101	<i>Papilionanthe vandarum</i>
				102	<i>Phalaenopsis taenialis</i>
				103	<i>Pholidota articulata</i>
				104	<i>Pholidota pallida</i>
				105	<i>Phreatia elegans</i>
				106	<i>Pinalia amica</i>
				107	<i>Pinalia graminifolia</i>
				108	<i>Pinalia spicata</i>

25	<i>Calanthe plantaginea</i>	53	<i>Dendrobium chrysanthum</i>	81	<i>Liparis cordifolia</i>	109	<i>Platanthera bakeriana</i>
26	<i>Cephalanthera damasonium</i>	54	<i>Dendrobium densiflorum</i>	82	<i>Liparis nervosa</i> var. <i> khasiana</i>	110	<i>Platanthera clavigera</i>
27	<i>Ceratostylis himalaica</i>	55	<i>Dendrobium falconeri</i>	83	<i>Liparis odorata</i>	111	<i>Platanthera dyeriana</i>
28	<i>Cheirostylis griffithii</i>	56	<i>Dendrobium fimbriatum</i>	84	<i>Liparis resupinata</i>	112	<i>Platanthera edgeworthii</i>
113	<i>Platanthera sikkimensis</i>	118	<i>Satyrium nepalense</i> var. <i>Ciliatum</i>	123	<i>Sunipia bicolor</i>	128	<i>Vanda cristata</i>
114	<i>Platanthera urceolata</i>	119	<i>Schoenorchis gemmata</i>	124	<i>Sunipia nepalensis</i>	129	<i>Vandopsis undulate</i>
115	<i>Pleione hookeriana</i>	120	<i>Spathoglottis ixioides</i>	125	<i>Taeniophyllum retrospiculatum</i>	130	<i>Zeuxine flava</i>
116	<i>Pleione humilis</i>	121	<i>Spiranthes sinensis</i>	126	<i>Vanda alpine</i>	131	<i>Zeuxine goodyeroides</i>
117	<i>Satyrium nepalense</i>	122	<i>Stereochilus hirtus</i>	127	<i>Vanda bicolor</i>		

Annexure 5: Checklist of Mammal Species of SWS

Sl #	Common Name	Scientific Name	Family	Order
1	Red Panda	<i>Ailurus fulgens</i>	Ailuridae	Carnivora
2	Gaur	<i>Bos</i> sp	Bovidae	Artiodactyla
3	Himalayan Goral	<i>Naemorhedus goral</i>	Bovidae	Artiodactyla
4	Himalayan Serow	<i>Capricornis thar</i>	Bovidae	Artiodactyla
5	Bhutan Takin	<i>Budorcas taxicolor whitei</i>	Bovidae	Artiodactyla
6	Red Fox	<i>Vulpes vulpes</i>	Canidae	Carnivora
7	Wild Dog	<i>Cuon alpinus</i>	Canidae	Carnivora
8	Assamese Macaque	<i>Macaca assamensis</i>	Cercopithecidae	Primates
9	Capped Langur	<i>Trachypithecus pileatus</i>	Cercopithecidae	Primates
10	Arunachal macaque	<i>Macaca munzala</i>	Cercopithecidae	Primates
11	Barking Deer	<i>Muntiacus muntjak</i>	Cervidae	Artiodactyla
12	Sambar	<i>Cervus unicolor</i>	Cervidae	Artiodactyla
13	Sikkim Mountain Vole	<i>Neodon sikimensis</i>	Cricetidae	Rodentia
14	Common Leopard (Black Panther)	<i>Panthera pardus</i>	Felidae	Carnivora
15	Clouded Leopard	<i>Neofelis nebulosa</i>	Felidae	Carnivora
16	Common Leopard	<i>Panthera pardus</i>	Felidae	Carnivora
17	Himalayan Jungle Cat	<i>Felis</i> sp	Felidae	Carnivora
18	Leopard Cat	<i>Prionailurus bengalensis</i>	Felidae	Carnivora
19	Royal Bengal Tiger	<i>Panthera tigris tigris</i>	Felidae	Carnivora
20	Marbled Cat	<i>Pardofelis marmorata</i>	Felidae	Carnivora
21	Asiatic Golden Cat	<i>Catopuma temminckii</i>	Felidae	Carnivora
22	Himalayan Crestless Porcupine	<i>Hystrix brachyura</i>	Hystriidae	Rodentia
23	Musk Deer	<i>Moschus</i> sp	Moschidae	Artiodactyla
24	Sikkim Mouse	<i>Mus pahari</i>	Muridae	Rodentia
25	Siberian Weasel	<i>Mustela sibirica</i>	Mustelidae	Carnivora
26	Yellow-throated Marten	<i>Martes flavigula</i>	Mustelidae	Carnivora
27	Forrest's Pika	<i>Ochotona forresti</i>	Ochotonidae	Lagomorpha
28	Large-eared Pika	<i>Ochotona macrotis</i>	Ochotonidae	Lagomorpha
29	Moupin's Pika	<i>Ochotona thibetana</i>	Ochotonidae	Lagomorpha
30	Bhutan Giant Flying Squirrel	<i>Petaurista</i> sp	Sciuridae	Rodentia
31	Black Giant Squirrel	<i>Ratufa bicolor</i>	Sciuridae	Rodentia
32	Himalayan Stripped Squirrel	<i>Tamiops macclellandi</i>	Sciuridae	Rodentia
33	Orange-bellied Himalayan Squirrel	<i>Dremomys lokriah</i>	Sciuridae	Rodentia
34	Pallas squirrel/Red-bellied Tree squirrel	<i>Callosciurus erythraeus</i>	Sciuridae	Rodentia
35	Himalayan Water Shrew	<i>Chimarrogale</i> sp	Soricidae	Eulipotyphla
36	Wild Pig	<i>Sus scrofa</i>	Suidae	Artiodactyla
37	Himalayan Mole	<i>Euroscaptor micrura</i>	Talpidae	Eulipotyphla
38	Asiatic Black Bear	<i>Ursus thibetanus</i>	Ursidae	Carnivora
39	Masked Palm Civet	<i>Paguma larvata</i>	Viverridae	Carnivora

Annexure 6: Checklist of Bird Species of SWS

SI #	Common Name	Scientific Name	SI #	Common Name	Scientific Name
1	Alpine Accentor	<i>Prunella collaris</i>	30	Golden-throated Barbet	<i>Megalaima franklinii</i>
2	Altai Accentor	<i>Prunella himalayana</i>	31	Great Barbet	<i>Megalaima virens</i>
3	Robin Accentor	<i>Prunella rubeculoides</i>	32	Hoary-throated Barwing	<i>Actinodura nipalensis</i>
4	Rufous-breasted Accentor	<i>Prunella strophiata</i>	33	Rusty-fronted Barwing	<i>Actinodura egertoni</i>
5	Eurasian Sparrowhawk	<i>Accipiter nisus</i>	34	Grey-winged Blackbird	<i>Turdus boulboul</i>
6	Black-headed Shrike Babbler	<i>Pteruthius rufiventer</i>	35	White-collared Blackbird	<i>Turdus albocinctus</i>
7	Slender-billed Scimitar Babbler	<i>Xiphirhynchus superciliosus</i>	36	Long-tailed Broadbill	<i>Psarisomus dalhousiae</i>
8	Black-chinned Yuhina	<i>Yuhina nigrimenta</i>	37	Great hornbill	<i>Buceros bicornis</i>
9	Brown Parrotbill	<i>Paradoxornis unicolor</i>	38	Black Bulbul	<i>Hypsipetes leucocephalus</i>
10	Brown-throated Fulvetta	<i>Alcippe ludlowi</i>	39	Himalayan Bulbul	<i>Pycnonotus leucogenys</i>
11	Chestnut-tailed Minla	<i>Minla strigula</i>	40	Mountain Bulbul	<i>Hypsipetes mccllellandii</i>
12	Golden Babbler	<i>Stachyris chrysaea</i>	41	Red-vented Bulbul	<i>Pycnonotus cafer</i>
13	Golden-breasted Fulvetta	<i>Alcippe chrysotis</i>	42	Striated Bulbul	<i>Pycnonotus striatus</i>
14	Green Shrike Babbler	<i>Pteruthius xanthochlorus</i>	43	Brown Bullfinch	<i>Pyrrhula nipalensis</i>
15	Long-tailed Sibia	<i>Heterophasia picaoides</i>	44	Red-headed Bullfinch	<i>Pyrrhula erythrocephala</i>
16	Pygmy Wren Babbler	<i>Pnoepyga pusilla</i>	45	Crested Bunting	<i>Melophus lathamii</i>
17	Rufous Sibia	<i>Heterophasia capistrata</i>	46	Grey Bushchat	<i>Sexicola ferrea</i>
18	Rufous-backed Sibia	<i>Heterophasia annectens</i>	47	Common Buzzard	<i>Buteo buteo</i>
19	Rufous-capped Babbler	<i>Stachyris ruficeps</i>	48	Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i>
20	Rufous-vented Yuhina	<i>Yuhina occipitalis</i>	49	Yellow-billed Chough	<i>Pyrrhocorax graculus</i>
21	Rufous-winged Fulvetta	<i>Alcippe castaneiceps</i>	50	Collared Treepie	<i>Dendrocitta frontalis</i>
22	Rusty-cheeked Scimitar Babbler	<i>Pomatorhinus erythrogenys</i>	51	Common Green Magpie	<i>Cissa chinensis</i>
23	Streak-breasted Scimitar Babbler	<i>Pomatorhinus ruficollis</i>	52	Grey Treepie	<i>Dendrocitta formosae</i>
24	Stripe-throated Yuhina	<i>Yuhina gularis</i>	53	Large-billed Crow	<i>Corvus macrorhynchos</i>
25	Whiskered Yuhina	<i>Yuhina flavicollis</i>	54	Rufous Treepie	<i>Dendrocitta vagabunda</i>
26	White-browed Shrike Babbler	<i>Pteruthius flaviscapis</i>	55	Yellow-billed Blue Magpie	<i>Urocissa flavirostris</i>

27	Yellow-throated Fulvetta	<i>Alcippe cinerea</i>	56	Black-tailed Crane	<i>Porzana bicolor</i>
28	Blue-throated Barbet	<i>Megalaima asiatica</i>	57	Asian Emerald Cuckoo	<i>Chrysococcyx maculatus</i>
29	Crimson-fronted Barbet	<i>Megalaima rubricapilla</i>	58	Drongo Cuckoo	<i>Surniculus lugubris</i>
59	Eurasian Cuckoo	<i>Cuculus canorus</i>	90	Blue-throated Flycatcher	<i>Cyornis rubeculoides</i>
60	Grey-bellied Cuckoo	<i>Cacomantis passerinus</i>	91	Dark-sided Flycatcher	<i>Muscicapa sibirica</i>
61	Hodgson's Hawk Cuckoo	<i>Hierococcyx fugax</i>	92	Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i>
62	Indian Cuckoo	<i>Cuculus micropterus</i>	93	Little Pied Flycatcher	<i>Ficedula westermanni</i>
63	Large Hawk Cuckoo	<i>Hierococcyx sparveriooides</i>	94	Pale Blue Flycatcher	<i>Cyornis unicolor</i>
64	Lesser Cuckoo	<i>Cuculus poliocephalus</i>	95	Red-throated Flycatcher	<i>Ficedula parva</i>
65	Oriental Cuckoo	<i>Cuculus saturatus</i>	96	Rufous-gorgeted Flycatcher	<i>Ficedula strophhiata</i>
66	Plaintive Cuckoo	<i>Cacomantis merulinus</i>	97	Slaty-backed Flycatcher	<i>Ficedula hodgsonii</i>
67	Black-winged Cuckooshrike	<i>Coracina melaschistos</i>	98	Slaty-blue Flycatcher	<i>Ficedula tricolor</i>
68	Cutia	<i>Cutia nipalensis</i>	99	Ultramarine Flycatcher	<i>Ficedula superciliaris</i>
69	Brown Dipper	<i>Cinclus pallasi</i>	100	Verditer Flycatcher	<i>Eumyias thalassina</i>
70	White-throated Dipper	<i>Cinclus cinclus</i>	101	Little Forktail	<i>Enicurus scouleri</i>
71	Ashy Drongo	<i>Dicrurus leucophaeus</i>	102	Slaty-backed Forktail	<i>Enicurus schistaceus</i>
72	Black Drongo	<i>Dicrurus macrocercus</i>	103	Spotted Forktail	<i>Enicurus maculatus</i>
73	Bronzed Drongo	<i>Dicrurus aeneus</i>	104	Satyr Tragopan	<i>Tragopan satyra</i>
74	Crow-billed Drongo	<i>Dicrurus annectans</i>	105	Blyth's Tragopan	<i>Tragopan blythii</i>
75	Lesser Racket-tailed Drongo	<i>Dicrurus remifer</i>	106	Temminck's Tragopan	<i>Tragopan temminckii</i>
76	Spangled Drongo	<i>Dicrurus hottentottus</i>	107	Blood Pheasant	<i>Ithaginis cruentus</i>
77	Ruddy Shelduck	<i>Tadorna ferruginea</i>	108	Hill Partridge	<i>Arborophila torqueola</i>
78	Black Eagle	<i>Ictinactes malayensis</i>	109	Himalayan Monal	<i>Lophophorus impejanus</i>
79	Crested Serpent Eagle	<i>Spilornis cheela</i>	110	Kalij Pheasant	<i>Lophura leucomelanos</i>
80	Mountain Hawk Eagle	<i>Spizaetus nipalensis</i>	111	Rufous-throated Partridge	<i>Arborophila rufogularis</i>
81	Common Kestrel	<i>Falco tinnunculus</i>	112	Snow Partridge	<i>Lerwa lerwa</i>
82	White-throated Fantail	<i>Rhipidura albicollis</i>	113	Tibetan Snowcock	<i>Tetraogallus tibetanus</i>
83	Yellow-bellied Fantail	<i>Rhipidura hypoxantha</i>	114	Crested Goshawk	<i>Accipiter trivirgatus</i>
84	Crimson-browed Finch	<i>Propyrrhula subhimachalus</i>	115	Northern Goshawk	<i>Accipiter gentilis</i>

85	Gold-naped Finch	<i>Pyrrhula aurantiaca</i>	116	Yellow-breasted Greenfinch	<i>Carduelis spinoides</i>
86	Scarlet Finch	<i>Haematospiza sipahi</i>	117	Himalayan Griffon	<i>Gyps himalayensis</i>
87	Fire-breasted Flowerpecker	<i>Dicaeum ignipectus</i>	118	Collared Grosbeak	<i>Mycerobas affinis</i>
88	Yellow-vented Flowerpecker	<i>Dicaeum chrysorrheum</i>	119	Spot-winged Grosbeak	<i>Mycerobas melanozanthos</i>
89	Asian Brown Flycatcher	<i>Muscicapa dauurica</i>	120	White-winged Grosbeak	<i>Mycerobas carnipes</i>
121	Hen Harrier	<i>Circus cyaneus</i>	152	Common Myna	<i>Acridotheres tristis</i>
122	Chinese Pond Heron	<i>Ardeola bacchus</i>	153	Fire-tailed Myzornis	<i>Myzornis pyrrhura</i>
123	Yellow-rumped Honeyguide	<i>Indicator xanthonotus</i>	154	White-throated Needletail	<i>Hirundapus caudacutus</i>
124	Common Hoopoe	<i>Upupa epops</i>	155	Grey Nightjar	<i>Caprimulgus indicus</i>
125	Ibisbill	<i>Ibidorhyncha struthersii</i>	156	Large-tailed Nightjar	<i>Caprimulgus macrurus</i>
126	Eurasian Jay	<i>Garrulus glandarius</i>	157	Large Niltava	<i>Niltava grandis</i>
127	Crested Kingfisher	<i>Megaceryle lugubris</i>	158	Rufous-bellied Niltava	<i>Niltava sundara</i>
128	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	159	Small Niltava	<i>Niltava macgrigoriae</i>
129	Black Kite	<i>Mitrus migrans</i>	160	Spotted Nutcracker	<i>Nucifraga caryocatactes</i>
130	Black-faced Laughingthrush	<i>Garrulax affinis</i>	161	Chestnut-bellied Nuthatch	<i>Sitta castanea</i>
131	Blue-winged Laughingthrush	<i>Garrulax squamatus</i>	162	White-tailed Nuthatch	<i>Sitta himalayensis</i>
132	Chestnut-crowned Laughingthrush	<i>Garrulax erythrocephalus</i>	163	Maroon Oriole	<i>Oriolus traillii</i>
133	Lesser Laughingthrush	<i>Garrulax monileger</i>	164	Collared Scops Owl	<i>Otus bakkamoena</i>
134	Rufous-chinned Laughingthrush	<i>Garrulax rufogularis</i>	165	Mountain Scops Owl	<i>Otus spilocephalus</i>
135	Spotted Laughingthrush	<i>Garrulax ocellatus</i>	166	Spot-bellied Eagle Owl	<i>Bubo nipalensis</i>
136	Streaked Laughingthrush	<i>Garrulax lineatus</i>	167	Asian Barred Owllet	<i>Glaucidium cuculooides</i>
137	Striated Laughingthrush	<i>Garrulax striatus</i>	168	Collared Owllet	<i>Glaucidium brodiei</i>
138	White-crested Laughingthrush	<i>Garrulax leucolophus</i>	169	Slaty-headed Parakeet	<i>Psittacula himalayana</i>
139	White-throated Laughingthrush	<i>Garrulax albogularis</i>	170	Speckled Piculet	<i>Picumnus innominatus</i>
140	Orange-bellied Leafbird	<i>Chloropsis hardwickii</i>	171	Barred Cuckoo Dove	<i>Macropygia unchall</i>
141	Red-billed Leiothrix	<i>Leiothrix lutea</i>	172	Mountain Imperial Pigeon	<i>Ducula badia</i>

142	Red-faced Liocichla	<i>Liocichla phoenicea</i>	173	Oriental Turtle Dove	<i>Streptopelia orientalis</i>
143	Asian House Martin	<i>Delichon dasyus</i>	174	Rock Pigeon	<i>Columba livia</i>
144	Eurasian Crag Martin	<i>Hirundo rupestris</i>	175	Snow Pigeon	<i>Columba leuconota</i>
145	Nepal House Martin	<i>Delichon nipalensis</i>	176	Speckled Wood Pigeon	<i>Columba hodgsonii</i>
146	Silver-eared Mesia	<i>Leiothrix argentauris</i>	177	Spotted Dove	<i>Streptopelia chinensis</i>
147	Long-tailed Minivet	<i>Pericrocotus ethologus</i>	178	Wedge-tailed Green Pigeon	<i>Treron sphenura</i>
148	Scarlet Minivet	<i>Pericrocotus flammeus</i>	179	Olive-backed Pipit	<i>Anthus hodgsoni</i>
149	Short-billed Minivet	<i>Pericrocotus brevirostris</i>	180	Rosy Pipit	<i>Anthus roseatus</i>
150	Red-tailed Minla	<i>Minla ignotincta</i>	181	Striated Prinia	<i>Prinia criniger</i>
151	Plain Mountain Finch	<i>Leucosticte nemoricola</i>	182	Black Redstart	<i>Phoenicurus ochruros</i>
183	Blue-fronted Redstart	<i>Phoenicurus frontalis</i>	214	Crimson Sunbird	<i>Aethopyga siparaja</i>
184	Hodgson's Redstart	<i>Phoenicurus hodgsoni</i>	215	Fire-tailed Sunbird	<i>Aethopyga ignicauda</i>
185	Plumbeous Water Redstart	<i>Rhyacornis fuliginosus</i>	216	Green-tailed Sunbird	<i>Aethopyga nipalensis</i>
186	White-bellied Redstart	<i>Hodgsonius phaeniceuroides</i>	217	Mrs Gould's Sunbird	<i>Aethopyga gouldiae</i>
187	White-capped Water Redstart	<i>Chaimarrornis leucocephalus</i>	218	Fork-tailed Swift	<i>Apus pacificus</i>
188	White-winged Redstart	<i>Phoenicurus erythrogaster</i>	219	House Swift	<i>Apus affinis</i>
189	Indian Blue Robin	<i>Luscinia burnnea</i>	220	Himalayan Swiftlet	<i>Collocalia brevirostris</i>
190	Orange-flanked Bush Robin	<i>Tarsiger cyanurus</i>	221	Common Tailorbird	<i>Orthotomus sutorius</i>
191	Oriental Magpie Robin	<i>Copsychus saularis</i>	222	Chestnut-headed Tesia	<i>Tesia castaneocoronata</i>
192	Rufous-breasted Bush Robin	<i>Tarsiger hyperythrus</i>	223	Blue Rock Thrush	<i>Monticola solitarius</i>
193	White-tailed Robin	<i>Myiomela leucura</i>	224	Blue Whistling Thrush	<i>Myophonus caeruleus</i>
194	Indian Roller	<i>Coracias benghalensis</i>	225	Blue-capped Rock Thrush	<i>Monticola cinclorhynchus</i>
195	Beautiful Rosefinch	<i>Carpodacus pulcherrimus</i>	226	Chestnut-bellied Rock Thrush	<i>Monticola rufiventris</i>
196	Common Rosefinch	<i>Carpodacus erythrinus</i>	227	Long-tailed Thrush	<i>Zoothera dixonii</i>
197	Dark-breasted Rosefinch	<i>Carpodacus nipalensis</i>	228	Plain-backed Thrush	<i>Zoothera mollissima</i>
198	Dark-rumped Rosefinch	<i>Carpodacus edwardsii</i>	229	Scaly Thrush	<i>Zoothera dauma</i>
199	Pink-browed Rosefinch	<i>Casprodacus rodochrous</i>	230	Black-throated Tit	<i>Aegithalos concinnus</i>
200	Red-fronted Rosefinch	<i>Carpodacus puniceus</i>	231	Coal Tit	<i>Parus ater</i>

201	Streaked Rosefinch	<i>Carpodacus rubicilloides</i>	232	Fire-capped Tit	<i>Cephalopyrus flammiceps</i>
202	White-browed Rosefinch	<i>Carpodacus thura</i>	233	Green-backed tit	<i>Parus monticolus</i>
203	Green Sandpiper	<i>Tringa ochropus</i>	234	Grey-crested Tit	<i>Parus dichrous</i>
204	White-browed Shortwing	<i>Brachypteryx montana</i>	235	Rufous-vented Tit	<i>Parus</i>
205	Grey-backed Shrike	<i>Lanius tephronotus</i>	236	Rufous-vented Tit	<i>Parus rubidiventris</i>
206	Long-tailed Shrike	<i>Lanius schach</i>	237	Sultan Tit	<i>Melanochlora sultanea</i>
207	Wood Snipe	<i>Gallinago nemoricola</i>	238	Yellow-cheeked Tit	<i>Parus spilonotus</i>
208	Solitary Snipe	<i>Gallinago solitaria</i>	239	Brown-throated Treecreeper	<i>Certhia discolor</i>
209	Eurasian Tree Sparrow	<i>Passer montanus</i>	240	Eurasian Treecreeper	<i>Certhia familiaris</i>
210	House Sparrow	<i>Passer domesticus</i>	241	Rusty-flanked Treecreeper	<i>Certhia nipalensis</i>
211	Russet Sparrow	<i>Passer rutilans</i>	242	Ward's Trogon	<i>Harpactes wardi</i>
212	Streaked Spiderhunter	<i>Arachnothera magna</i>	243	Red-headed Trogon	<i>Harpactes erythrocephalus</i>
213	Black-throated Sunbird	<i>Aethopyga saturata</i>	244	Grey Wagtail	<i>Motacilla cinerea</i>
245	White Wagtail	<i>Motacilla alba</i>	265	Lemon-rumped Warbler	<i>Phylloscopus chloronotus</i>
246	White-browed Wagtail	<i>Motacilla maderaspatensis</i>	266	Pale-footed Bush Warbler	<i>Cettia pallidipes</i>
247	Wallcreeper	<i>Tichodroma muraria</i>	267	Russet Bush Warbler	<i>Bradypterus mandelli</i>
248	Yellow-vented Warbler	<i>phylloscopus contator</i>	268	Smoky Warbler	<i>Phylloscopus fulgiventor</i>
249	Aberrant Bush Warbler	<i>Cettia flavolivacea</i>	269	Spotted Bush Warbler	<i>Bradypterus thoracicus</i>
250	Ashy-throated Warbler	<i>Phylloscopus maculipennis</i>	270	Tickell's leaf warbler	<i>Phylloscopus affinis</i>
251	Black-faced Warbler	<i>Abroscopus schisticeps</i>	271	Whistler's Warbler	<i>Seicercus whistleri</i>
252	Blyth's Leaf Warbler	<i>Phylloscopus reguloides</i>	272	Yellow-bellied Warbler	<i>Abroscopus superciliaris</i>
253	Brown Bush Warbler	<i>Bradypterus luteoventris</i>	273	Yellow-browed Warbler	<i>Phylloscopus inornatus</i>
254	Brown-flanked Bush Warbler	<i>Cettia fortipes</i>	274	Yellowish-bellied Bush Warbler	<i>Cettia acanthizoides</i>
255	Buff-barred Warbler	<i>Phylloscopus pulcher</i>	275	Winter Wren	<i>Troglodytes troglodytes</i>
256	Chestnut-crowned Bush Warbler	<i>Cettia major</i>	276	Oriental White-eye	<i>Zosterops palpebrosus</i>
257	Chestnut-crowned Warbler	<i>Seicercus castaniceps</i>	277	Bay Woodpecker	<i>Blythipicus pyrrhotis</i>
258	Dusky Warbler	<i>Phylloscopus fuscatus</i>	278	Crimson-breasted Woodpecker	<i>Dendrocopos cathpharius</i>
259	Golden-spectacled Warbler	<i>Seicercus burkii</i>	279	Darjeeling Woodpecker	<i>Dendrocopos darjellensis</i>

260	Greenish Warbler	<i>Phylloscopus trochiloides</i>	280	Greater Yellowthroat	<i>Picus flavinucha</i>
261	Grey-cheeked Warbler	<i>Seicercus poliogenys</i>	281	Grey-capped Woodpecker	Pygmy <i>Dendrocopos canicapillus</i>
262	Grey-hooded Warbler	<i>Seicercus xanthoschistos</i>	282	Grey-headed Woodpecker	<i>Picus canus</i>
263	Grey-sided Bush Warbler	<i>Cettia burnnifrons</i>	283	Rufous-bellied Woodpecker	<i>Dendrocopos hyperythrus</i>
264	Hume's Warbler	<i>Phylloscopus humei</i>			

Annexure 7: Checklist of Butterfly Species of SWS

Sl#	Common Name	Scientific Name	Sl#	Common Name	Scientific Name	Sl#	Common Name	Scientific Name
1	Dark Judy	<i>Abisara fylla</i>	22	Common Hedge Blue	<i>Acytolepis puspa</i>	43	Common Castor	<i>Ariadne merione</i>
2	Yellow Coster	<i>Acraea issoria</i>	23	Indian Tortoiseshell	<i>Aglais cashmirensis</i>	44	Common Maplet	<i>Chersonesia risa</i>
3	Hill Sergeant	<i>Athyma opalina</i>	24	Chocolate Albatross	<i>Appias lynceida</i>	45	Red-base Jezebel	<i>Delias pasitioe</i>
4	Common Satyr	<i>Aulocera Swaha</i>	25	Indian Fritillary	<i>Argyreus hyperbius</i>	46	Pale jezebel	<i>Delias sanata</i>
5	Pallid Argus	<i>Callerebia scanda</i>	26	Great Windmill	<i>Atrophaneura dasarada</i>	47	Lesser Punch	<i>Dodona dipoea</i>
6	Red Lacewing	<i>Cethosia biblis</i>	27	Mottled Emigrant	<i>Catopsilia pyranthe</i>	48	Striped Punch	<i>Dodona outida</i>
7	Blue Tit	<i>Chliaria kina</i>	28	Dark Clouded Yellow	<i>Colias croceus</i>	49	Yellow Orangetip	<i>Ixias pyrene</i>
8	Common Map	<i>Cyrestis thyodamas</i>	29	Yellow Jezebel	<i>Delias agostina agostina</i>	50	Lemon Pansy	<i>Junonia orithya</i>
9	Plain Tiger	<i>Danaus chryseippus</i>	30	White-Edged Blue Baron	<i>Euthalia phemius</i>	51	Common Sailor	<i>Neptis hylas</i>
10	Common Tiger	<i>Danaus genutia</i>	31	Azure Sapphire	<i>Heliophorous androcles</i>	52	Common Peacock	<i>Papilio polyctor</i>
11	Hill Jezebel	<i>Delias belladonna</i>	32	Common Woodbrown	<i>Lethe sidonis</i>	53	Stately Nawab	<i>Poltura dolon</i>
12	Blue Duchess	<i>Euthalia duda</i>	33	Straight Banded Treebrown	<i>Lethe verma</i>	54	Common Nawab	<i>Precis athamas</i>
13	Crice	<i>Hestina nama</i>	34	Moore's Bushbrown	<i>Mycalasis heri</i>	55	Chocolate Soldier	<i>Precis iphita</i>
14	Lilacfork	<i>Lethe sura</i>	35	Restricted Demon	<i>Notocrypta curvifascia</i>	56	Blue Pancy	<i>Precis orithya</i>
15	Red Helen	<i>Menelaides helenus</i>	36	Tailed Redbreast	<i>Papilio bootes</i>	57	Common Flash	<i>Rapala nissa</i>
16	Bush Brown	<i>Mycalasis sp</i>	37	White commondore	<i>Parasarpa dudu</i>	58	Eastern Courtier	<i>Sephis chandra</i>
17	Yellow sailer	<i>Neptis ananta</i>	38	Bicolour Commondore	<i>Parasarpa zayla</i>	59	Graham's Ace	<i>Sovia grahami</i>
18	Red Breast	<i>Papilio alcmenor</i>	39	Large Cabbage White	<i>Pieris brassicae</i>	60	Grass Demon	<i>Udaspes folus</i>
19	Tabby	<i>Pseudergolis wedah</i>	40	Indian Cabbage White	<i>Pieris canidia</i>	61	Painted Lady	<i>Vanessa cardui</i>
20	Popinjay	<i>Stibochiona nicea</i>	41	Small Tawany Wall	<i>Rhaphicera moorei</i>	62	Indian Red Admiral	<i>Vanessa indica</i>
21	Punchiello	<i>Zemoros flegyas</i>	42	Three Spot grass Yellow	<i>Terias blanda</i>	63	Himalayan Fivering	<i>Ypthima sakra</i>

Annexure 8: Financial Projection for Plan Period (Recurrent)

Budget Code	Title	Year Wise Budget Projection (Nu. in million)										Total
		Y 1	Y 2	Y 3	Y 4	Y 5	Y 6	Y 7	Y 8	Y 9	Y 10	
1.01	Pay and Allowances	8.78	9.52	10.30	11.40	12.90	13.74	14.85	15.00	15.15	15.30	126.94
2.01	Other Personnel Emolument	0.46	0.46	0.47	0.47	0.48	0.48	0.49	0.49	0.50	0.50	4.80
11.01	Travel-In-country & LTC	5.87	6.26	6.65	7.23	8.21	8.54	9.10	9.67	10.24	10.80	82.57
12.01	Utilities-Telephone, Telex	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	2.00
12.02	Utilities-Telegram, Postage	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.95
12.03	Utilities-Electricity, Water, Sewerage	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	1.05
12.05	Utilities-Fuel-wood	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	1.05
13.01	Rental of Properties-Buildings	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.35
14.01	Office Supplies, Printing, Publication	0.17	0.17	0.18	0.18	0.19	0.02	0.20	0.20	0.21	0.21	1.73
14.06	Uniform, Extension Kits, Linens	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.57
15.01	Maintenance of Property-Building	0.15	0.17	0.19	0.21	0.23	0.25	0.27	0.29	0.31	0.33	2.40
15.02	Maintenance of Property-Vehicle	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	1.55
15.05	Maintenance of Property-Equipment	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.95
15.07	Maintenance of Property-Computers	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.10	0.11	0.85
15.09	Maintenance of Property-water supply, Sewerage	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.55
17.01	Op.Exp- Advertising	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.59
17.02	Op.Exp- Bank Charges ,Royalties, Duties	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.35
17.03	Op.Exp- Transportation	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.60
17.08	Op.Exp- In-country Meeting & Celebration	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.10	0.11	0.85
24.03	Contribution-Provident Fund	0.70	0.75	0.80	0.85	0.90	0.95	0.95	1.00	1.00	1.00	8.90
Total		17.01	18.30	19.61	21.46	24.09	25.26	27.19	28.07	28.89	29.72	239.60

Provide maximum protection to representative ecosystems through building strategic conservation programs for keystone/flagship species	Conserve Representative Ecosystem and Social Wellbeing	Strategic Action 1: Initiate research program to understand species, landscapes and threats to conservation											
		Activity 1: Assessment of threats to biodiversity conservation	0.50										0.50
		Activity 2: Determine significance of core zone	0.50										0.50
		Activity 3: Develop monitoring and management program	0.05										0.05
		Strategic Action 2: Conservation and management of endangered and problem wildlife species											
		a) Takin (<i>Budorcas taxicolor whitei</i>)											
		Activity 1: Determine habitat range and behaviour differences between the introduced Takin	0.30	0.30									0.60
		Activity 2: Create artificial salt licks	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.20
		Activity 3: Conduct regular monitoring	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.28	1.90
		b) Royal Bengal Tiger (<i>Panthera tigris</i>)											
		Activity 1: Habitat mapping and determination of population	0.20				0.40					0.60	1.20
		Activity 2: Develop strategy and monitoring plan		0.10				0.20				0.30	0.60
		c) Red Panda (<i>Ailurus fulgens</i>)											
		Activity 1: Habitat mapping and determination of population	0.20		0.30			0.40				0.50	1.40
		Activity 2: Develop strategy and monitoring plan		0.10		0.15		0.20				0.25	0.70
		d) Musk Deer (<i>Moschus sp.</i>)											
		Activity 1: Determine distribution, status and specific epithet of the Musk Deer	0.70										0.70
		Activity 2: Regular monitoring		0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	1.62
		e) Wild Dog (<i>Cuon alpinus</i>)											
		Activity 1: Habitat mapping and determination of population	0.10										0.10
		Activity 2: Determine ecology of Wild Dog and livestock depredation pattern		0.15									0.15
		f) Asiatic Black Bear (<i>Ursus thibetanus</i>)											
		Activity 1: Habitat mapping and determination of population		0.20									0.20
		Activity 2: Study on ecology and status of the species		0.20									0.20
		g) Blyth's Tragopan (<i>Tragopan blythii</i>)											
		Activity 1: Determine existence of the species			0.20								0.20
		Activity 2: Mapping of habitat and distribution of the species.				0.20							0.20
		Strategic action 3: Conservation of Chir pine (<i>Pinus roxburghii</i>) and Bhutan pine (<i>Pinus bhutanica</i>)											
Ensure sustainable utilization of natural resources													

through appropriate management plans	Activity 1: Conduct study on the status of regeneration of Chir pine and Bhutan pine	0.10		0.10			0.10			0.30	
	Activity 2: In accordance to the study result- initiate habitat manipulation (control burning in Chir pine and thinning/clearing in Bhutan pine forest) work if required	0.50			0.20			0.20		0.90	
	Activity 3: Monitoring		0.10	0.12	0.14	0.16	0.18	0.20	0.22	1.12	
	Strategic action 4: Conservation and management of <i>Quercus semecarpifolia</i> and <i>Picea spinulosa</i>										
	Activity 1: Conduct study on the status of <i>Quercus semecarpifolia</i> and <i>Picea spinulosa</i>	0.20	0.20								0.40
	Activity 2: Obtain public endorsement to protect this species	0.10	0.10								0.20
	Activity 3: Initiate preservation activity for and formulate monitoring guidelines for these species	0.50	0.50								1.00
	Strategic action 5: Conservation of Champ (<i>Michelia</i> sp) and Himalaya Yew (<i>Taxus</i> sp)										
	Activity 1: Ecological study of Champ and Himalayan Yew				0.10						0.10
	Activity 2: Define specific epithet of Himalayan Yew				0.10						0.10
	Activity 3: Prescribe management prescription for these species					0.05					0.05
	Strategic Action 6: Determine status of small mammal, herpetofauna, butterfly and fresh water biodiversity										
	Activity 1: Conduct study			0.30	0.20						0.50
	Activity 2: Publication and monitoring				0.05	0.05					0.10
	Strategic Action 7: Habitat Management										
	Activity 1: Creation of salt licks and water holes	0.50							0.50		1.00
	Activity 2: Assessment of wetlands	0.20									0.20
	Activity 3: Restoration of wetlands	1.00				0.80					1.80
	Activity 4: Restocking of alpine grasslands through clearing of bushes		0.50	0.50					0.80		1.80
	Activity 5: Carryout ecological thinning				0.60				0.70		1.30
	Strategic Action 8: Habitat Improvement										
	Activity 1: Plantation of Bamboo, fruit bearing trees and banana			0.60				0.80			1.40
	Strategic Action 9: Forest Fire Prevention										
	Activity 1: Awareness program	0.20	0.30	0.40		0.50		0.60			2.00
	Activity 2: Creation of fire line	0.50	0.50								1.00
	Activity 3: Maintenance of fire lines			0.05	0.06	0.07	0.08	0.09	0.10	0.12	0.57
	Strategic Action 10: Revision of Management Zones										

Annexure 10: Logical Framework for Monitoring and Evaluation of Plan Program

Context Status	Design and Planning		Inputs and Process			Outputs and Outcomes		Program Risk		
	Management Program	Baseline	Strategic Action	Inputs Objectively Verifiable Indicator	Implementing Agency	Location	Outputs Means of Verification		Outcomes Objective fulfilled	
Insufficient Tsamdro (Pasture land)	Program 1: Rehabilitate degraded Tsamdro and enhance livestock productivity	Grazing right and calendar	1. Initiate scientific management of degraded Tsamdro	1. Leasing of reverted Tsamdro/pasture land to communities of Merak and Sakteng completed	Dzongkhag & SWS	Leased Tsamdro area	Tsamdro allotted as per leased rule	1,7&8	User consensus & fund	
				2. Degraded Tsamdro identified & user consensus to initiate rangeland management program acquired	SWS & herders	Degraded areas	Area of degraded Tsamdro identified for rehabilitation	1,7&8		User consensus & fund
				3. Grazing carrying capacity study conducted & degraded rangeland under scientific management	"	Most degraded areas	Report & area covered under land management	1,5,7&8		
				4. Degraded leased pasture land/rangeland rehabilitated through planting fodder trees, bamboo species and suitable grass species for improved fodder production	DoL, SWS & Herders	"	Quantity planted	1,4&7		Availability of suitable fodder & grass seeds
				5. Improved cattle breed supplied on pilot basis. Free forest grazing	SWS	SWS	Nos. of improved breed supplied	1,4&7		

Human-Wildlife Conflict (Crop Depredation)	Program 2: Reduce crop depredations	Crop depredation reports	1. Supply of electric/solar or alarm fencing on cost sharing basis	reduced & diary production increased	SWS & herders	"	"	On-farm cattle management & increased fodder production	1&7	Land holding
				6. Stall feeding initiated & supply of fodder trees intensified.	"	"	"	"	1,2,5,&7	User consensus
				7. Agroforestry on pilot basis in the leased pasture land to offset fodder shortages and intensify on-farm cattle management initiated	"	"	"	"	"	"
				1. Suitable site for installation of electric/solar and alarm fencing on pilot basis identified	SWS & DAO	Most problematic areas	Area under fencing program	2,4&5	Fund	
Human-Wildlife Conflict (Crop Depredation)	Program 2: Reduce crop depredations	Crop depredation reports	1. Supply of electric/solar or alarm fencing on cost sharing basis	2. Community well trained to install electric/solar and alarm fencing	SWS & community	Agrarian villages in SWS	Community able to install fencing	"	Peoples interest	
				3. Fencing program replicated throughout sanctuary jurisdiction on cost sharing basis	"	"	"	Crop depredation reduced by 50%	Fund	
Human-Wildlife Conflict (Crop Depredation)	Program 2: Reduce crop depredations	Crop depredation reports	1. Supply of electric/solar or alarm fencing on cost sharing basis	4. Timely monitoring & evaluation of fencing program conducted	"	"	"	Crop depredation reduced & fencing maintained	"	"

2. Initiate Crop Insurance Scheme	1. Pilot crop insurance schemes in worst affected areas initiated through defined by-laws & governance mechanisms to verify claims	SWS & community in collaboration with relevant stakeholder	Pilot villages	Nos. of groups formed & by-laws developed	2	Fund
	2. Seed money provided for to initiate crop insurance scheme	SWS	Agrarian villages in SWS	Amount provided as seed money	2	Fund
3. Initiation of Mixed Cropping Practice	1. Feasibility study to grow additional crop with maize in collaboration with agriculture sector conducted.	SWS & DAO	"	Mixed crops identified	2,4&5	Cooperation from DAO
	2. Pilot horticulture farming for sustainable production of agricultural products to meet food self-sufficiency initiated	"	Pilot villages	Harvesting additional crop	2,4&5	"
	3. Horticultural farming initiatives upscaled to rest of the communities inside the Sanctuary by engaging donors and actively sourcing the required funds	"	Agrarian villages in SWS	Mixed cropping practice coverage	2&4	Fund
	4. High yielding varieties of crops, fruit trees and vegetable seeds supplied	"	"	Quantity supplied	2&4	Fund

			SWS	high altitude community	Nos. supplied	2&4	Fund	
Human-Wildlife Conflict (Livestock Depredation)	Program 3: Alleviate Livestock Depredation and retaliatory killing	Livestock depredation reports	5. Polyhouse supplied					
			4. Determine Causes of Crop Depredation	"	SWS	Reports, strategy & action plans	2&5	
			1. Determine Causes of Livestock Depredation	"	"	Reports	2&5	
			2. Livestock Insurance Scheme	"	"	Livestock depredation reduced by 50%	2&4	
			SWS & relevant stakeholder	Worse affected areas	Livestock depredation cases compensated	2&6	Fund	
			SWS	SWS	Staff confident to verify livestock depredation case	2&5	Herder reports all depredation cases	
			"	"	Compensation disbursed fairly	2	Fund	
			"	"	"	2	Fund	

Loss of culture and traditions	Program 4: Promote local culture and tradition	Rich culture & tradition	3. Livestock product diversification, packaging and marketing	1. Livestock cooperatives formed & products are in high demand	SWS & herders	"	"	Nos. of cooperatives & product sold	2&3	
			4. Reduce poaching and retaliatory killing of wildlife species	2. High quality livestock product available in the area	"	"	High demand	2&3		
Loss of culture and traditions	Program 4: Promote local culture and tradition	Rich culture & tradition	1. Support local community to restore important cultural and religious sites	1. Ecological study of problematic species to develop appropriate strategy & action plans conducted	SWS	"	"	Study report & action plan	2&5	
			2. Promote traditional aesthetics of	2. SMART patrolling implemented	SWS	SWS	SWS	Well-equipped hardware & software	5&6	
				3. Check post constructed.	SWS	Strategic location		Illegal transaction reduced by 50%	6&7	Fund
				1. Important cultural and religious sites within SWS assessed & mapped	SWS	SWS		Reports	3,4&5	
				2. Local culture, folk tales & traditional knowledge documented	SWS in collaboration with local authorities	"		Documents	3&5	
				3. Important cultural & religious sites restored	"	SWS		Well managed cultural & religious sites	3&4	Fund
				4. Book on local culture, folk tales & traditional knowledge available	"	"		Documents	3	Fund
				1. Traditional look of wooden shingle restored	SWS	"		CGI sheet covered with wooden shingle	3	Community cooperation

villages under SWS	2. Pilot of shingle/shinglep treatment with appropriate wood preservatives to enhance its durability succeeded	SWS	"	Restoration of traditional aesthetic of village	3	
	3. People using treated Shingle/shinglep	SWS	"	Restoration of traditional aesthetic of village & durability of shingleps increased to two fold	3	Fund
	1. Sourced fund to support the supply of sheep and improved yak breed for wool production 2. Supply sufficient nos. of improved Sheep and Yak breed in collaboration with relevant stakeholder 3 Program to control feral dog population control in collaboration with relevant stakeholders completed	"	"	"	Nos. of improved breed supplied	3&4
3. Revival of decreasing Sheep and Yak population to increase wool production	SWS & DLO	"	"	Nos. of improved breed supplied	3&4	
	"	"	"	Incidence of sheep killed by feral dog reduced	3&4	Fund

Irrational collection of natural resources	Program 5: Meeting Resource Needs Sustainably and Promote Conservation Stewardship	Assemblage of rich biodiversity	4. Establish natural and cultural history museum	1. Site for construction of Nature, Culture and Historical Museum to document and promote unique cultural and traditional heritage of the local community identified	SWS	Strategic location	Centrally located site	3&4	
				2. Nature, Culture and Historical Museum constructed	SWS	"	Operationalization of museum	3,4&5	Fund
			1. Bring buffer and multiple use zones areas under scientific management with written management plan	1. Necessary field equipment and gears procured	SWS	"	SWS staff well equipped	5,6&9	Fund
				2. Assessment and mapping of timber and non-timber resources availability within SWS for developing sustainable utilization plan completed	SWS	SWS	Resource map	5,6&9	
				3. Timber resource inventory for development sustainable resource use guideline developed	SWS	multiple & buffer zones	Inventory report & harvest guideline	5,6&7	Fund
				4. Wood treatment technology developed	SWS & Community	"	Pressure on timber resources reduced	7	
				5. People adopted to use solar water heating system for cooking and warming	SWS	Settlements	Pressure on timber resources reduced	4,5&7	

		SWS & ITMS	"	Reports	4,5&7	
	3. Demand and availability of medicinal and aromatic plant (MAP) species in collaboration with the Institute of Traditional Medicine Services (ITMS) determined	SWS	"	Nos. of awareness program conducted	7	Fund
	4. Awareness programs to educate local community on the harvesting methods and guidelines of NWFPs conducted	SWS	"	Nos. Of cottage industries and outlets	3,4&7	
	5. NWFPP-based and cottage industries through providing appropriate training on processing and packaging promoted. Communities trained on making range of unique handicraft products from locally available materials and innovative marketing strategies developed	SWS	"	Nos. of NWFPP group	4&7	
	6. Sustainable collection of NWFPP initiated	SWS	"	Marketing formalized	4&7	
	7. Marketing of NWFPPs that are not consumed within Bhutan streamlined	SWS	"			

and biking trail	2. Write proposal to develop the facilities	SWS	"	Proposal	5	
	3. Biking -cum-trekking trail connecting Merak and Sakteng via Nyakchungla pass constructed	SWS & community	"	Trail length	4	Fund
	4: Ecological garden nearby the settlement of Merak and Sakteng and an amusement park with rhododendron garden at Sheteymi developed	"	SWS	Functionality	3,4,&5	Fund
	5. Birding and hiking trails within the SWS developed to promote nature based ecotourism	"	"	Nos. of trails	4	Fund
	6. Install signage (at least 25) at every entry points for visitors' awareness and education	SWS	"	Nos. of signages	5	
	7. Well maintained trails & campsites	SWS & community	"	Increasing no. of visitors	3&4	Public support
	8. Low cost climate smart structures campsite constructed	"	:	Informed local people	3,5,&8	
	9. Snow trout introduced into the high altitude lakes of SWS	SWS	"	Fish survived and tourist engaged in fishing sport	4&5	
	10. Possibility of skiing, paragliding and high	SWS & community	"	Commencement of skiing and paragliding	"	

Conserve Representative Ecosystem and Social Wellbeing	Program 7: Ensuring Species Persistence	2015 biodiversity data	3. Develop ecological and biodiversity hub	1. Feasibility study to establishment of ecological & biodiversity hub conducted	SWS	SWS	Study report	5&9	
				2. Planning and designing of ecological & biodiversity hub completed	"	"	Consultancy report	5	
				3. Proposal for the construction developed	"	"	Proposal	5	
				4. Ecological & biodiversity educational hub constructed	"	"	Environmental, species conservation education & awareness	5&9	Fund
				5. Landscaping & plantation completed	"	"	Conducive environment	5&9	Fund
				6. Promotion activities completed	SWS & DoFPS	"	Visitor flow	5&9	
				7. Additional amenities constructed	SWS	SWS	Accommodation facilities	5&9	Fund
				1. Threats to biodiversity conservation assessed	SWS	"	Report	5,6&10	
				2. Determine significance of core zone	"	"	Significance of corezone determined	5,6&10	
				3. Monitoring and management program developed	"	"	Monitoring plan	5,6&10	
Conservation			1. Scientific management of designated core zone						
			2. Conservation <i>Takin (Budorcas taxicolor whitei)</i>	"	"	Report	5,6&10		

and management of endangered and problem wildlife species	1. Habitat range and behaviour differences between the introduced Takin determined	"	"	"	Healthy Takin	5,6&10	
	2. Artificial salt licks created	"	"	"	Takin locations	5,6&10	
	3. Conduct regular monitoring	"	"	"	Report	2,5,6&10	
	Royal Bengal Tiger (<i>Panthera tigris</i>)						
	1. Habitat mapping & determination of population completed	"	"	"	Population & habitat status	5,6&10	
	2. Strategy & monitoring plan developed	"	"	"	Reports	5,6&10	
	Red Pand (Ailurus fulgens)						
	1. Habitat mapping & determination of population completed	"	"	"	Monitoring plan	5,6&10	
	2. Strategy & monitoring plan developed	"	"	"	Reports	5,6&10	Fund
	Musk Deer (<i>Moschus sp.</i>)						
	1. Distribution, status & specific epithet of the Musk Deer ascertained	"	"	"	Poaching reduced	5,6&10	
	2. Regular monitoring plan developed	"	"	"	HWC hotspot mapped	2,5,6&10	Fund
	Wild Dog (<i>Cuon alpinus</i>)						

<p>1. Habitat mapping & population determination completed</p> <p>2. Ecology of Wild Dog and livestock depredation pattern determined</p> <p>Asiatic Black Bear (Ursus thibetanus)</p> <p>1. Habitat mapping & determination of population completed</p> <p>2. Study on ecology & status of the species completed</p> <p>Blyth's Tragopan (Tragopan blythii)</p> <p>1. Study on existence of the species conducted</p> <p>2. Mapping of habitat and distribution of the species completed</p> <p>1. Study on the status of regeneration of Chir and Bhutan pine conducted</p> <p>2. In accordance to the study result habitat manipulation exercise initiated</p> <p>3. Monitoring</p>	"	"	"	"	"	"	"	"	"
	HWC reduced	2,5,6,9&10							
	HWC hotspot mapped	2,5,6&10							Fund
	HWC reduced	2,5,6&10							
	Report	5,6,9&10							Fund
	Report	5,6,9&10							
	Reports	5,6,7,9&10							
	Control burning in Chir pine & thinning/clearing in Bhutan pine forest								
	Forest reviving	5,6,7,9&10							

4. Conservation and management of Quercus semecarpifolia and Picea spinulosa	1. Study on the status of Quercus semecarpifolia and Picea spinulosa conducted	"	"	Report	5,6,7,9&10	
	2. Public endorsement for protecting of these species obtained	"	"	MoU developed	5,6,7&9	
	3. Preservation activity & monitoring guidelines for these species formulated	"	"	Preservation plots	5,6,7,9&10	Community cooperation
5. Conservation of Champ (Michelia sp) and Himalaya Yew (Taxus baccaata)	1. Ecological study of Champ & Himalayan Yew conducted	"	"	Report	5,6,7,&10	
	2. Specific epithet of Himalayan Yew confirmed	"	"	Report &evidence	5,6&7	
	3. Management prescription for these species developed	"	"	Plan	5,6&7	
6. Determine status of small mammal, herpetofauna, butterfly and fresh water biodiversity	1. Study conducted	"	"	Report	5,6&10	Fund
	2. Report & monitoring developed	"	"	Plan	5,6&10	
7. Habitat Management	1. Natural and artificial salt licks and water holes maintained	SWS	SWS	Animals attracted	5&6	
	2. Wet lands around SWS assessed and restoration of dried and	SWS	SWS	"	"	

	degraded wet land restored								
	3. Alpine grassland managed	SWS	"	"	Wildlife population increased	2,5&6			
	4. Ecological thinning completed	"	"	"	Regeneration of desire species and remaining tree attending volume	5&6			
8. Habitat Improvement	1. Bamboo, fruit bearing trees and banana plantation carried out	"	"	"	Wildlife population increased	"			
9. Forest Fire Prevention	1. Periodic awareness program conducted	"	"	"	Incidences of forest fire reduced	"			
	2. Fire line around fire prone area created	"	"	"	"	"			
7. Revision of SWS Management Zones	1. Functionality of designated zones assessed and revision of management zone conducted	"	"	"	Revised management zones	6,7&10			
	2. Critically eroded/landslide/degraded areas identified and designated as special protection zone	"	"	"	Endorsement report	6&7		To obtain endorsement	
	3. Important ecological assessed	"	"	"	No. of important ecological zone	6			
8. Quantification	1. Ecosystem services provided by	"	"	"	Report	1,4,6,7&8			

Soil and water conservation	Program 8: Management of Soil and Water Erosion	Deteriorating soil & water resources	of ecosystem services	conservation landscape and impact of climate change on such services quantified																		
				1. Regular patrolling.	SWS	"			Reports	5,6,7&10												
				2. Coordination meeting with Indian counterpart started	SWS & DoFPS	"			MoU	6,7&10												
				3. Zero poaching programs initiated	SWS	"			Capacity & strategy developed for implementation	6,7,9&10												
				4. Regular environmental education programmes carried out.	SWS	Schools, Religious institutions & communities in SWS			No. of programs conducted	5&6												
Soil and water conservation	Program 8: Management of Soil and Water Erosion	Deteriorating soil & water resources	of ecosystem services	5. Environmental education programs supported	SWS	Nature clubs & community				Amount	5&8											
				1. Assessment of critically degraded area completed	SWS	SWS			Report	1,5&8												
				2. Public endorsement acquired to designate the area as special protection zone	SWS & community	"			Endorsement report	8												
				3. Strategic plan of the area developed	"	"			Plan	8&10												
				4. Land management campaign conducted	"	"			Area	1,6,7,8&10												
				5. Water source protection & plantation completed	"	"				Protection & plantation area	1,5,7&8											

Climate change vulnerability	Program 9: Ensuring Climate Resilient Community	Available climate data	1. Monitor impact of climate change	6. Critically eroded and landslide areas assessed	"	"	Factors contributing to such degradation understood	1,5,6,7&8	
				7. Studies on the land management regimes conducted	SWS	"	Best land management technology practiced	1,5,7&8	
				8. Payment for ecosystem services (PES) from the settlements in the downstream initiated	"	"	Amount	1,6,7&8	
				1. Climate change vulnerability assessment in the settlements in & around SWS conducted	"	"	Report	5,7,8&10	
				2. Perception study on climate change, its causes & impact conducted	"	"	Reports	5,8&10	
				3. Awareness education on the climate change, its impact & factors contributing to global warming conducted	"	"	No. of programs conducted	5,8&10	Fund
				4. Permanent monitoring plot established	"	"	No. of plots	5,6,7,8&10	
				5. Monitoring protocol developed	"	"	Protocol	5,8&10	
			6. Periodic assessment of monitoring plot conducted	"	"	"	Assessment report	5,8&10	

	7. Monitoring data repository developed	"	"	"	Database	5,8&10	Community cooperation
2. Secure drinking water resources	1. Water user group formed	SWS & community	"	"	No. of active group	4,7,8&10	
	2. Protection & enrichment of drinking water source completed	"	"	"	Support provided	4,5,7&8	
	3. Climate change adaptation workshop conducted	"	"	"	No. of workshop	5,7&8	Fund
	4. Climate change adaptation programs initiated	"	"	"	Programs	5,7&8	Fund
3. Health and Hygiene	1. Quantity of solid waste & type of waste produced within the SWS assessed	"	"	"	Assessment report	4,5,8&10	
	2. Awareness education on the negative effects of solid waste on surrounding environment & wild animal conducted	"	"	"	No. of workshop	5,6,8&10	Fund
	3. Regular cleaning campaigns involving communities & school conducted	"	"	"	No. of campaign	8	
	4. Garbage bins & waste dumping sites in all the villages under the SWS installed	"	"	"	No. of bins & dumping sites	8	Fund
	5. Agreements and by-laws with local communities for proper	"	"	"	Agreements & by-laws	8&10	

PART II: SUSTAINABLE TIMBER HARVESTING PLAN (1st July 2019 to 30th June 2029)

1. Background

Contrary to most of the PAs in the world, Bhutan has a co-existence of human and wildlife inside the PA. The dependencies of the inhabitants on PAs for natural resources are tremendous. Therefore, PA management is a challenging task requiring various strategies to handle both human and the wildlife conservation in Bhutan.

Currently SWS is having an area of 740.60 km². It is in the process of extending area to cover whole Gewog areas of Merak and Sakteng since it is already providing forestry services to all the households of these two Gewogs. The proposal for extension of area was already submitted to the Department for approval and the total area of SWS is expected to be approximately 938.02 km².

There are approximately 5000 semi-nomads of Merak and Sakteng, who mainly depend on livestock for their livelihood. Only a few households residing in the lower areas of altitude below 2500 meter above sea level (masl) depends on subsistence farming. As a result of transhumance practice by the inhabitants, the dependencies and effect on the natural resources are enormous.

The rise of infrastructure development and the demand of rural house building timber have led to the significant pressure on the timber resources. Further, the lack of sustainable timber harvesting principle and practice unlike FMUs in the territorial divisions has affected the sustainability of these resources. The timber allotment record from 2004-2018 (Figure 24) shows that majority of the timbers were allotted to people dwelling outside the Sanctuary like Radhi, Phongmey, Bidung and Shongphu Gewogs owing to the limited timber stock in their regions. The next highest timber was allotted to the local inhabitants of Merak Gewog followed by Sakteng. At present, major portion of Sanctuary has become accessible by motorable roads and the timber demand from outside the Sanctuary has increased tremendously over the years in addition to the people living inside the Sanctuary. In early 2018, His Majesty the King has granted *khimsa* land to 333 people of Merak and Sakteng Gewogs for which the preparation of plan has become urgently necessary.



Figure 24: Graph showing timber allotment record (2004-2018)

The key objective of the plan is to regulate the rural timber supply on a sustainable basis from Merak, Sakteng and Joenkhar ranges. The plan will also achieve the target for Accelerating Bhutan's Socio-economic Development (ABSD) initiatives (Sustainable Forest Management Charter) under the compact signed with the Royal Government. This plan is valid for the period of 10 years from 1st July 2019 to 30th June 2029.

2. THE FOREST MANAGEMENT AREA

2.1 The Area

Merak range is the largest of all and is situated between the latitudes; 27° 21' 48.13" - 27° 7' 54.38" North and longitudes; 91° 42' 14.86" - 92° 7' 34.99" East. The range covers whole area of Merak Gewog with an area of 48259.9 ha. Sakteng encompasses an area of 33392.6 ha under Sakteng Gewog and is located between latitudes; 27° 28' 57.88" - 27° 16' 34.34" North and longitudes; 91° 50' 27.12"- 92° 7' 43.35" East. Joenkhar is the smallest of all ranges and is situated between the latitudes; 27° 29' 13.77" - 27° 18' 48.31" North and longitudes; 91° 46' 33.68" - 91° 54' 17.13" East under Sakteng Gewog covering a total area of 12150.4 ha. The overview of all the ranges under SWS is shown below (Figure 25 & Table 8).

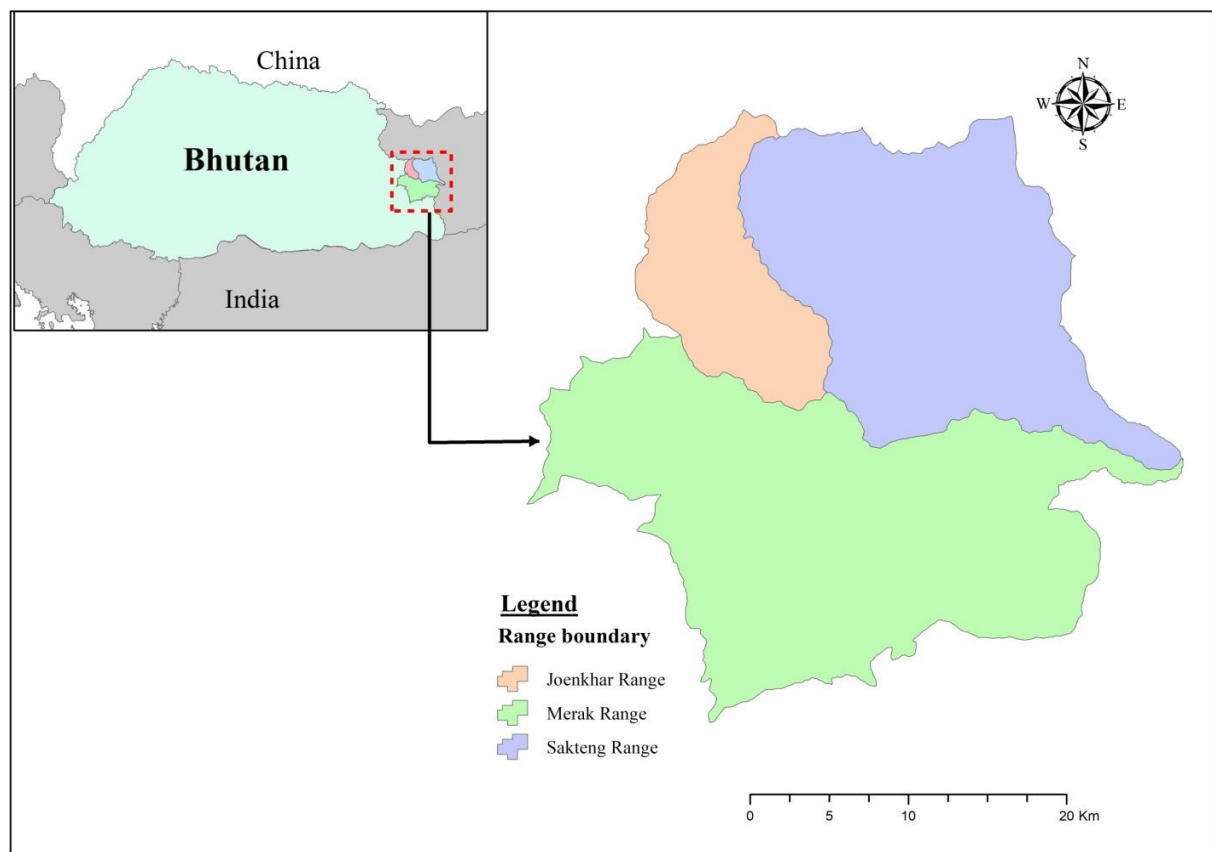


Figure 25: Map of SWS showing three ranges

Table 8: Overview of area in SWS

Sl.no	Type	Area (in ha)		
		Merak	Sakteng	Joenkhar
1	Core zone	7183	5566	1858
2	Forest management area	3333.8	4335.3	3239.5
3	Special protection zone	4358	1191.2	988
4	Others (Inaccessible area)	33385.1	22300.1	5593.9
5	Community forest			471
	Total	48259.9	33392.6	12150.4

The forest management area (FMA) is a designated area in each range which is divided into compartment (size 200-1000 ha) and sub-compartment (size 10-100 ha) with the specific management options for the resource allotment. There are 119 sub-compartments under 26 compartments in total. Merak range has the maximum (11) compartments followed by Sakteng (10) and Joenkhar (5) (Figure 26). The google maps of three FMAs are also provided in annexure 18.

The Sanctuary management has also established special protection zone to protect, preserve and support biodiversity and wild habitats that are degrading. The creation of such zone was recommended in the conservation management plan of SWS (2017-2027) which was felt necessary in order to restore the degrading ecosystem and biodiversity in the Sanctuary (SWS, 2016).

Inaccessible area designated in the plan is the one which are not managed for timber allocation because of the remoteness of the area where timber harvesting is not possible within the plan period. The stretch of an area of 100 m is also maintained around the core zone where harvesting of timber is restricted and can later be demarcated as core zone as emphasized in the participatory zoning report of 2011 which mentions that delineation of zone should be a continuous process whereby areas can be increased for the conservation purposes in future (WWF Bhutan and SWS, 2011).

The protection zone was also retained in the FMA and refers to an area having the slopes greater than 45 degrees and along motorable public roads (200 m uphill, 100 m downhill) where felling of tree is not permitted. The area above 3800 masl was also avoided from felling of trees and designated as the protection zone due to poor growth rate, barren land and lesser timber stock.

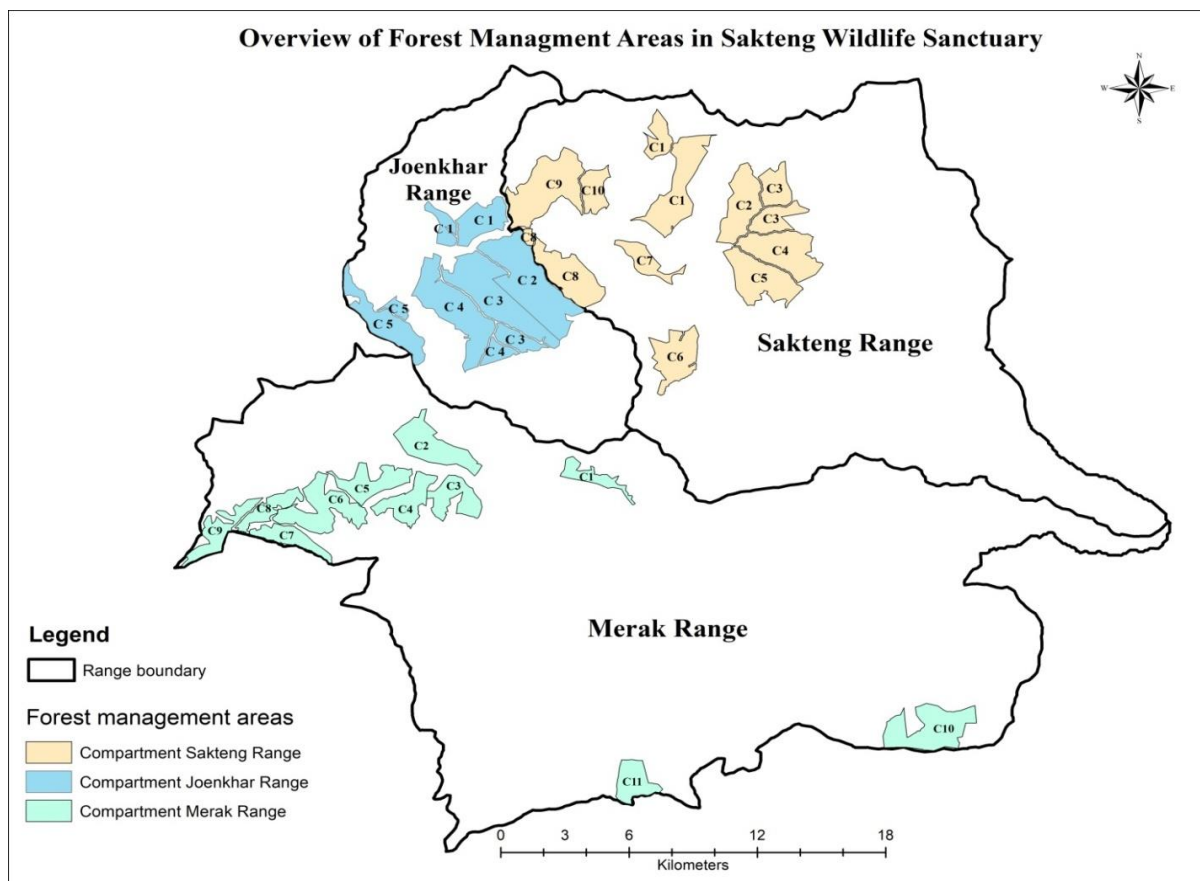


Figure 26: Overview map of SWS

The areas which are excluded from the rural timber allotment are shown below (Table 9).

Table 9: Areas excluded from timber harvesting

Area	Core zone		Special protection zone		Community forest		Others	
	Name	(ha)	Name	(ha)	Name	(ha)	Name	(ha)
Merak	Yanglay_Yangchung, Merak and Jomophodrang	7183	Khateyri - Drana	3539			Inaccessible area	33385.1
			Merak	819				
Sakteng	Dorbrok, Pherilock, Baythangtse, Dalam	5566	Manirong springshed	813				22300.1
			Tshokha springshed	99.2				
			Pherilok Red Panda habitat	279				
Joenkhar	Gelong Phukpa	1858	Pangkom	988	Yumzang Semthun	471		5593.9
Total		14607		6537.2		471	61279.1	
Overall total								82894.3

A total of 82894.3 ha in SWS were excluded from timber harvesting because they are either inaccessible or designated for other management purposes. Of this total, majority were inaccessible areas (61279.1 ha) followed by core zone (14607 ha), special protection zone (6537.2 ha) and community forest (471 ha).

Drana, which lies in the North-west part of Merak is degraded and the Sanctuary initiated the land management activity in collaboration with various stakeholders funded by Darwin Initiatives. Towards extreme North-west lies Khateyri catchment and according to Gamri Watershed Management Plan of 2009 (Wangchuk et al., 2009), the area should be prioritized for protection. This catchment therefore, should be refrained from timber harvesting and need to be designated and preserved as special protection zones. The part of Merak encompassing several water sources and settlements including *lhakhang* was also demarcated as special protection zone to preserve the water sources (Figure 27). In Sakteng, places like Manirong and Tshokha springsheds were delineated as special protection zone to protect the water sources for people of Sakteng and Thrakthri. Pherilok will be conserved for Red panda conservation as per the recommendation from the past studies (Dorjee, 2010, 2012) (Figure 28). Pangkom in the South- west part of Joenkhar range with steep terrain and landslide prone area will be exempted from timber allocation, and assigned as special protection zone (Figure 29).

In total, there are 10908.6 ha of FMA in SWS. Sakteng has the largest FMA (4335.3 ha) followed by Merak (3333.8 ha) and Joenkhar (3239.5 ha) as shown in the table 10.

Table 10: Forest management areas

Type	Area (ha)			Total area (ha)
	Merak	Sakteng	Joenkhar	
Non Forest Area ^[1]	141.1	386.2	237.5	764.8
Protection Zones	98.9	146.3	215.4	460.6
Inoperable Areas	908.7	1281.3	1242.1	3432.1
Production Areas	2185.1	2521.5	1544.5	6251.1
	3333.8	4335.3	3239.5	10908.6

¹ This comprises only of small non forest areas which are located within some sub-compartments of the forest management area.

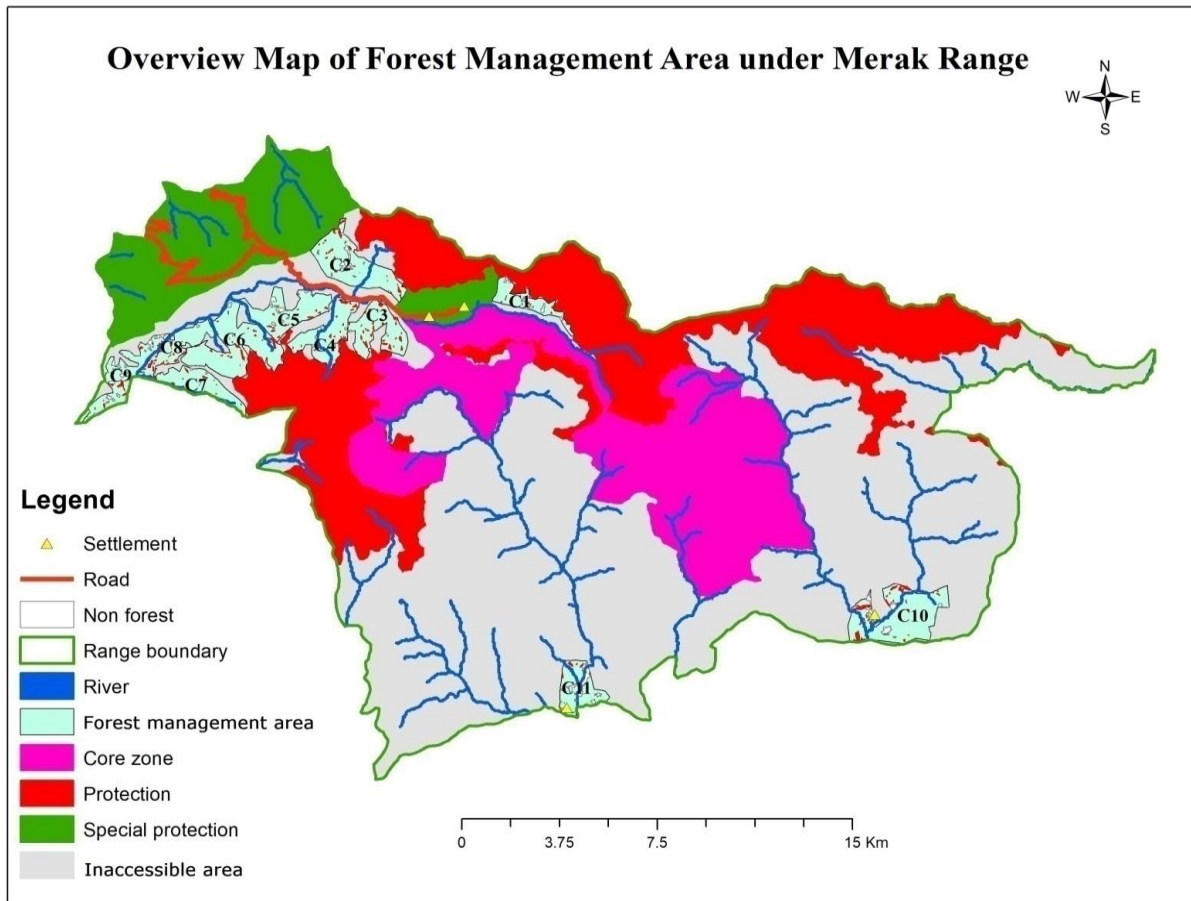


Figure 27: Overview map of Merak range

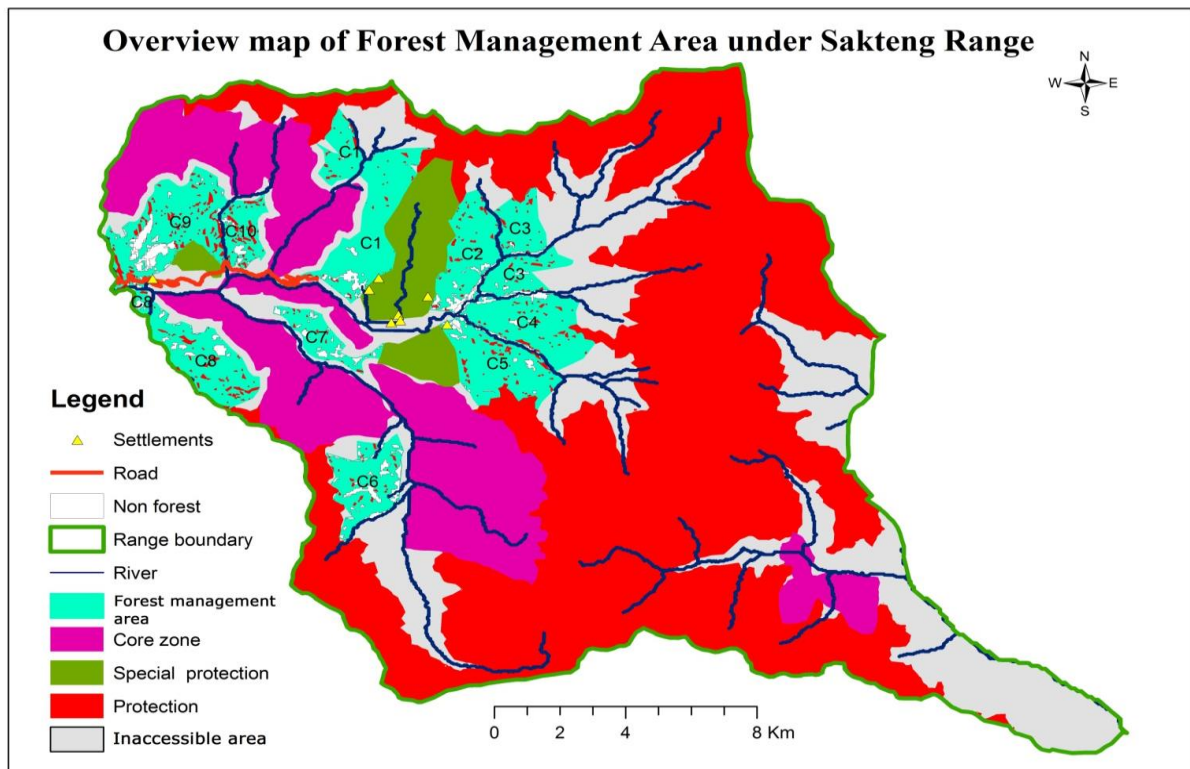


Figure 28: Overview map of Sakteng range

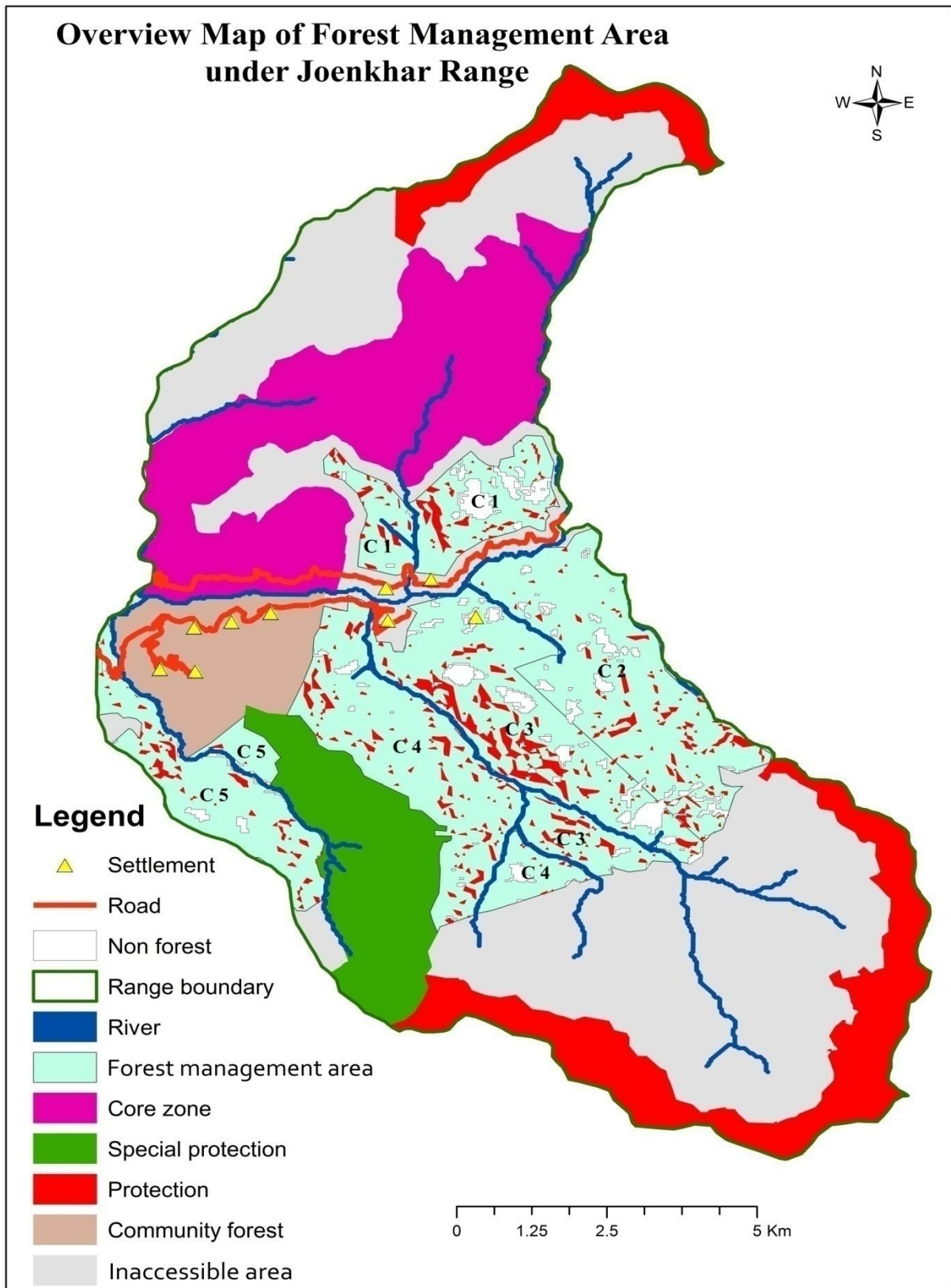


Figure 29: Overview map of Joenkhar range

2.2 Forest Type and Condition

Merak FMA lies mostly in the fir (66%) and hardwood (22%) zone with the age ranging from young (9%) to mature (55%). Whereas Sakteng FMA has fir (51%) forest as a dominant vegetation type and hemlock and blue pine forest as least dominant each with 1%. The age class varies from young (7%) to mature (68%). Joenkhar has mostly hardwood (74%) and mixed hardwood & conifer (HC) zones (13%). Joenkhar FMA has various age distribution, minimum being the over matured (5%) and maximum being matured age class (71%).

Looking at the present forest conditions, it is observed that Merak range is heavily exploited for timber in the last few decades. Although the scientific silvicultural systems were used, some parts of the forest were heavily harvested. This is because, in addition to meeting the demand from local inhabitants, the demand from the neighbouring Gewogs of Radhi, Phongmey, Shongphu and Bidung were also met from Merak due to its proximity and limited timber in their areas. The natural regeneration could be seen in the harvested areas and most of the regeneration consists of fir species. As there was good natural regeneration, no artificial regeneration in the form of plantation was carried out in the harvested areas.

It was found that larch was mostly concentrated alongside the streams and landslide areas above 2500m altitude. Few stands of *Taxus baccata* were found in mixed conifer forest of Merak and Sakteng. *Quercus semecarpifolia* was found limited alongside the Gam-ri and it is the most preferred firewood species in Sakteng. The countable *Picea spinulosa* were also recorded from Pussa village in Sakteng which requires the immediate conservation efforts.

The distribution of the forest types are shown in the graph below (Figure 30). The general conditions of the forest for all areas were poor to average. The forest conditions near the villages were average due to the intensive use of forest by the locals for grazing and lopping. Forest type distribution as well as forest condition and canopy closure per compartment can be derived from the respective sheet (Annexure 12, 14 & 16). The Land Use and Land Cover (LULC) classification map of SWS depicting all the range are shown in Figure 31.

From the forest assessment, it was established that the average standing volume was maximum for Merak (380 m³/ha) followed Sakteng (298 m³/ha) and Joenkhar (205 m³/ha). The average basal area was maximum for Sakteng (22.1 m²/ha) followed by Merak (18.9 m²/ha) and Joenkhar (16.9 m²/ha) (Annexure 11).

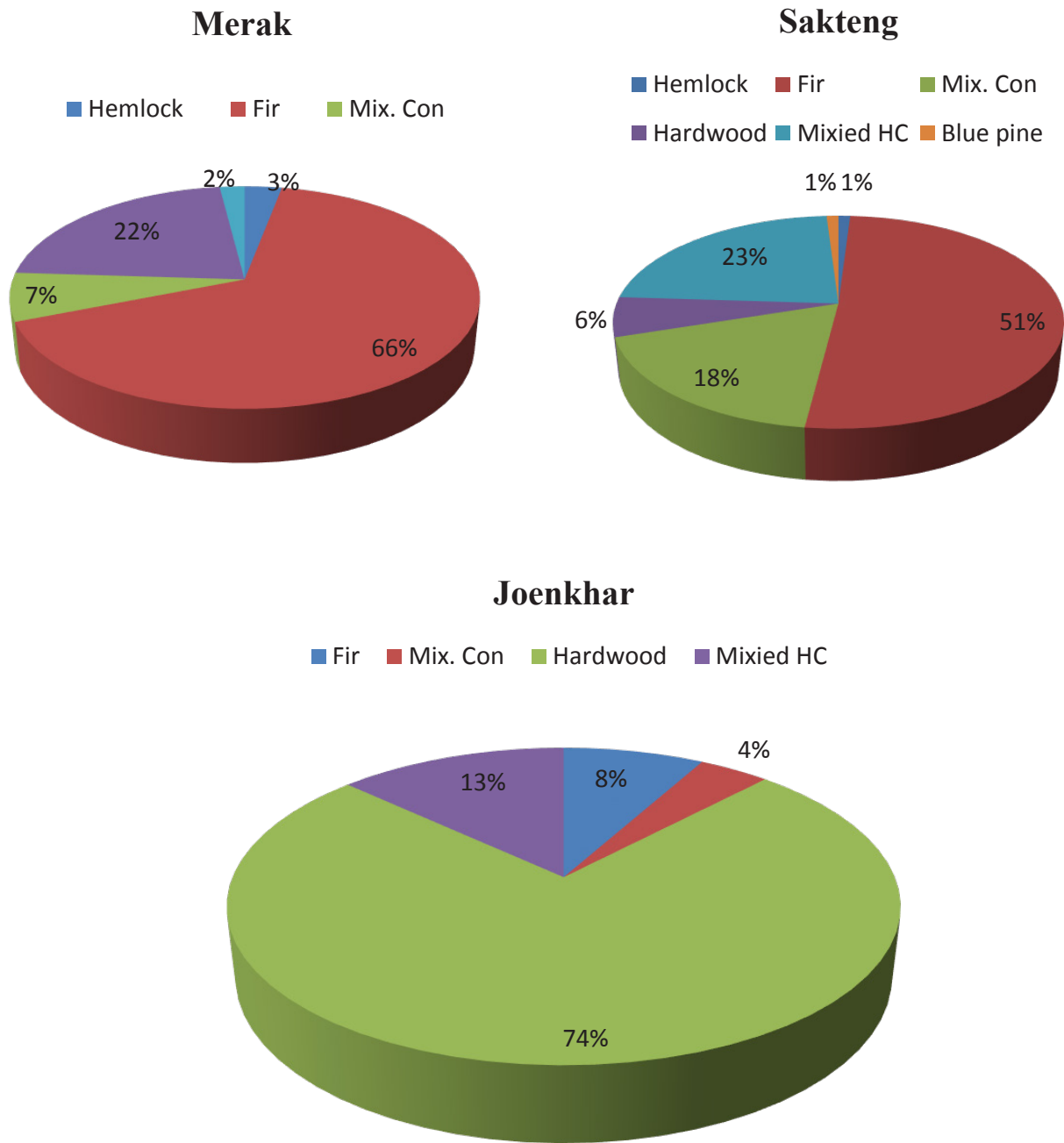


Figure 30: Distribution of forest types

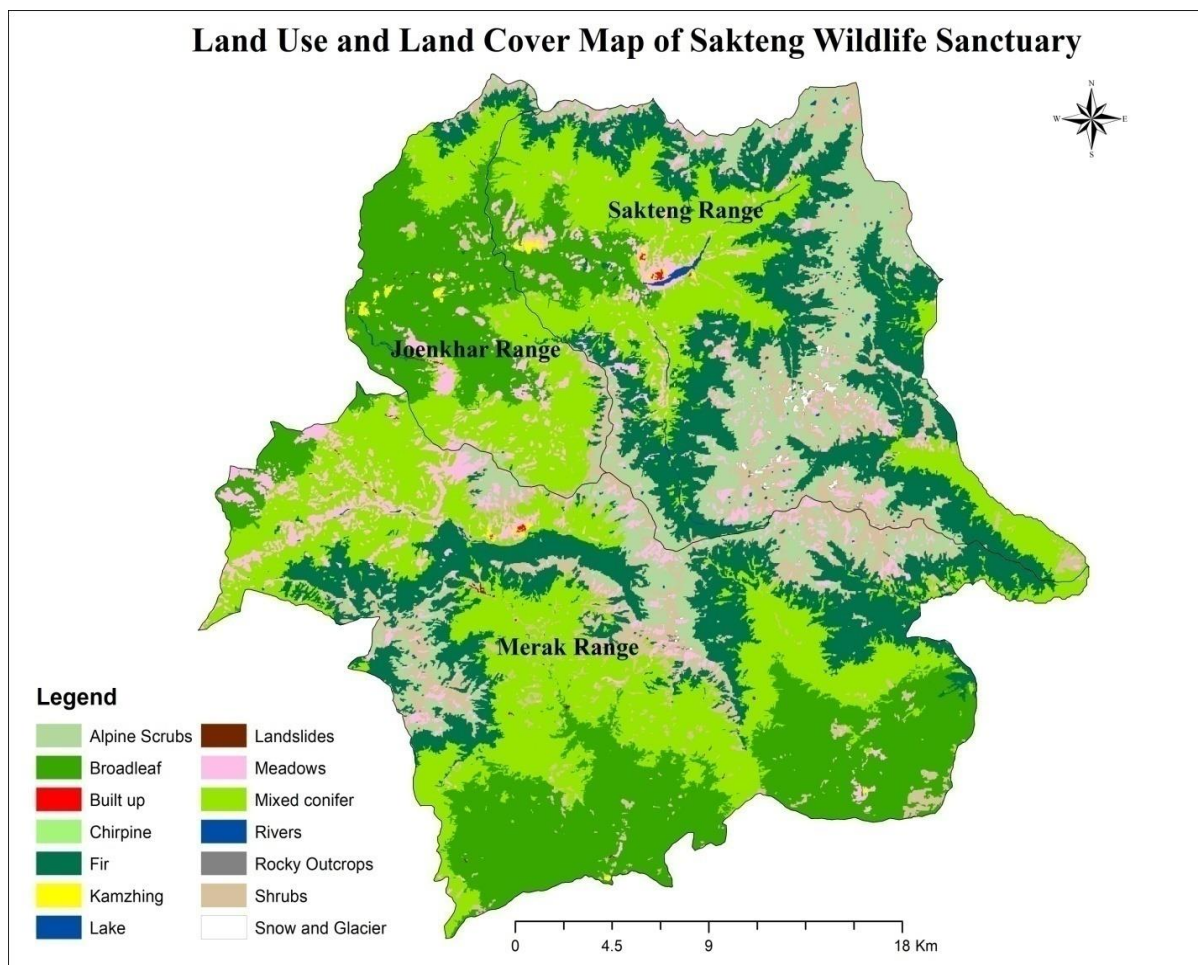


Figure 31: LULC map of SWS

2.3 Site and Forest Function

The average site condition is shown below (Table 11), the site condition for individual compartments or sub-compartments are presented in annexure 12-17.

Table 11: Site condition

	Merak	Sakteng	Joenkhar
Slope (%)			
Gentle	21	14	19
Moderate	50	60	48
Steep	29	26	33
Erosiveness (%)			
Stable	49	18	36
Moderate	46	67	59
Unstable	6	14	5

Stability (%)			
High	26	8	23
Moderate	57	78	67
Low	17	15	10

The terrain is moderate in some of the compartments, however, most of the compartments are moderate to steep and mountainous. Slope classification was done with the help of geographic information system (GIS). Areas that were considered over 100% were delineated as protection zones where no activities can take place.

The slope class ranges from gentle (21%) to moderate (50%) at Merak. Some parts of Merak were unstable and sloppy and necessitate to be preserved as special protection zone. This includes Drana and Khateyri catchment areas. Sakteng FMA comprises of gentle (14%) to moderate (60%) slope. The slopes of Sakteng, particularly in Northern, Eastern and Southern parts are steep and rocky and mandate exemption from timber allocation (protection zone). Joenkhar, on the other hand, in general consists of gentle (19%) to moderate (48%) slope. The sub compartments 3i, 3j, 4g in the Southern part and the area stretch called Pangkom in the South-west are steep and landslide prone areas and therefore, should be exempted from timber allocation.

There are three major rivers viz; Gam-ri, Mera-ama-ri and Jomo-ri in SWS. Gam-ri falls in Sakteng and Joenkhar ranges whereas Mera-ama-ri and Jomo-ri flows from Merak. Gam-ri originates from the extreme North-eastern part bordering India at Jang-Puensum and Dremaling lake connected by several smaller streams. Mera-ama-ri originates from Kayakpa, Northern edge of Mount Yanglay-Yangchung. Jomo-ri begins from Serkemla and Mount Jomo Kungkhar joined by number of small and big streams.

The motorable roads are present in all the ranges. The road from Khardung to Merak, Rangjung to Sakteng and Phongmey to Joenkhar all have a road buffer of 200m uphill and 100m downhill which shall be excluded from harvesting of timber.

2.4 Accessibility

Accessibility is one of the important factors for timber extraction. The motorable road facilitates the transport of resources from forest to the end-users. Some of the compartments in FMAs are accessible by road while majority are inaccessible and are far flung from the road head.

In Merak, the compartments like C1 (Nakarpo-Naju), C2 (Sakshum), C3 (Serkemla-Sangtasa), C4 (Phakchu) and C5 (Damangjuk) are accessible by road whereas C6 (Gasejab-Jangphutse), C7 (Dothrabthrab-Betheng), C8 (Gasabjuk-Rongbreng) and C9 (Phrengla-Gomthe) are away from the road head.

The new farm road connecting Sakteng Gewog Centre from Rangjung has made some of the sub-compartments like 9g, 9e, 9c, 8a and 10a accessible by road. This road will further give convenience for timber extraction from few of the sub-compartments nearby.

For Joenkhar, the farm road from Phongmey may ease the extraction of timber from 5a, 4a, 3a and 3b whereas sub-compartments like 2g, 3g and 4g are completely away from the motorable road making the extraction of timber difficult. The sub-compartments 1a and 1c in C1 are near the farm road from Ranjung to Sakteng.

3. NWFP AND OTHER FOREST USES

The number of non-wood forest products (NWFPs) recorded in the FMAs are tabulated below (Table 12). The distribution of NWFPs for compartments and sub compartments are presented in annexure 12-17.

Table 12: NWFPs and important forest uses

FMA	NWFP	Abundant	Sparse	Forest Uses	Intensive	Extensive
		(%)	(%)		(%)	(%)
Merak	Bamboo	8	14	Grazing	25	61
	Cane	0	0	Shoksing	0	0
	Daphne	2	10	Lopping	8	6
Sakteng	Bamboo	13	14	Grazing	35	46
	Cane	0	1	Shoksing	0	0
	Daphne	10	17	Lopping	8	18
Joenkhar	Bamboo	21	33	Grazing	25	71
	Cane	0	0	Shoksing	0	0
	Daphne	11	39	Lopping	10	27

The main NWFPs available in the FMAs are bamboo and daphne. Both are found sparsely in all the FMAs (Table 12). Growth of bamboo is confined to small pockets along the depression of the rivers and streams. The new regeneration is coming up and will be available for harvest in most of the areas. Bamboo is commonly used by the local people for fencing, roofing, rope-making and containers for dairy product used mostly for domestic purposes. Daphne was found plenty in majority of the sub compartments and was used by the villagers for different domestic purposes.

Besides the commonly found NWFP, there are several medicinal plants available in the FMAs. Earlier study (Dorji et al., 2017), revealed that there are around 68 medicinal and aromatic plants (MAPs), of which 59 genera belonging to 36 families, used by the local people of Merak, Sakteng and Joenkhar in SWS. The commonly available species were *Ligularia* sp, *Bistorta* sp, *Rubia* sp and *Potentilla* sp which were used by the local people for the medicinal purposes.

Grazing was observed almost throughout the FMAs. The local communities have the traditional rights for grazing their cattle in the Sanctuary. There were number of *Tsamdo* (grazing land) in the Sanctuary used by the local people. Extensive grazing by yaks was observed in the Northern part of Merak. In Sakteng, intensive grazing was found in the North-west part of the region leading to poor regeneration. In Joenkhar, intensive grazing was observed at Taksarjuk-Tshorpurong and Kherilok-Tshonang compartments.

The intense livestock grazing and clearing of alpine bushes to increase the fodder availability were also found as the potential conservation threats for the wildlife like Himalayan Musk Deer in SWS (Tobgay et al., 2017; Wangdi et al., 2018). Therefore, in order to maintain and promote healthy meta-populations of species, the conservation intervention such as regulated grazing and collection of forest resources has to be implemented strictly. The introduction of improved breed of livestock and awareness to the local inhabitant is highly recommended.

Besides grazing, the use of forest like lopping in the immediate vicinity of the village and cattle huts were commonly seen. Most of the fodder species were extensively lopped by the herder which needs regular monitoring.

4. SOCIO-ECONOMICS

There are about 772 numbers of household comprising 4770 populations (source: Gewog administrations). Of the total, Merak has the highest number of population (3075) followed by Sakteng (1292) and Joenkhar (421).

The community of Merak and Sakteng are mostly semi-nomadic depending largely on livestock for their livelihood except for some communities practicing subsistence agriculture in the lower region of Kheliphu and Khashiteng at Merak and Thrakthri at Sakteng. The community of Joenkhar rear livestock and practice agriculture as well. In summer months, from May till October, herders take their cattle to the mountain pasturelands. By the month of September, they migrate down for winter pasturelands and stay for about five to eight months until the next migration in summer. There are approximately 19392 numbers of cattle owned by the local community of SWS. The cattle population distributed amongst different breeds is shown below (Table 13). Merak has the highest number of cattle (10087) followed by Sakteng (8759) and Joenkhar (546).

Table 13: Population of cattle in SWS

Cattle breed	Calf < 1 year		Heifer	Milch	Dry	Brd.	Bull	Bullock	Total
	Male	Female				Bull			
Merak									
Doethra-Doethram	0	15	61	145	196	5	0	11	433
Mithun	3	0	0	0	0	1	0	0	4
Jaba	0	0	0	1	0	0	0	1	2
Jatsha-Jatsham	23	25	120	792	347	0	46	19	1372
Jersey cross	0	5	0	0	0	0	0	5	10
Yangku-Yangkum	23	71	148	408	362	5	0	50	1067
Yak	130	208	317	809	546	395	0	314	2719
Zo-zom	270	218	232	1705	674	0	0	1381	4480
Total	449	542	878	3860	2125	406	46	1781	10087
Sakteng									
Jersey pure	0	0	0	0	0	0	0	0	0
Jersey Cross	3	2	14	29	2	3	7	0	60
Brown Swiss Cross	2	1	4	6	1	0	1	0	15
Holstein-Friesian	0	0	1	0	0	0	0	0	1
Mithun Pure (only Brd. Bull)	0	0	0	0	0	7	0	0	7
Jatsha-Jatsham	2	6	105	396	51	0	58	8	626
Yanku-Yankum	16	23	87	197	50	3	92	19	487
Doeb-Doebum	5	3	18	27	6	2	28	0	89
Doethra-Doethram	0	0	2	5	0	1	2	0	10
Nublang-Thrabum	1	10	28	76	24	2	21	3	165
Yak	263	333	577	966	450	350	450	164	3553
Zo-zom	145	261	469	1492	170	0	1001	208	3746
Total	437	639	1305	3194	754	368	1660	402	8759
Joenkhar									
Jersey Pure		0	0	0	0	1	0	0	1
Jersey Cross	2	10	35	52	6	3	17	3	128
Brown Swiss Cross	0	0	0	0	0	0	1	0	1
Mithun Pure (only Brd. Bull)	0	0	0	0	0	1	0	0	1
Jatsha-Jatsham	0	0	11	19	3	0	19	3	55
Yanku-Yankum	3	3	23	8	0	0	26	3	66
Doeb-Doebum	7	0	13	6	2	0	4	1	33
Nublang-Thrabum	3	2	15	16	2	1	19	2	60
Yak	14	13	8	29	7	7	3	8	89
Zo-zom	6	5	10	42	9	0	22	18	112
Total	35	33	115	172	29	13	111	38	546
Overall total	921	1214	2298	7226	2908	787	1817	2221	19392

(Source: Merak and Sakteng Gewog Administration Office, 2019)

Their income are mostly through the sale of dairy products such as butter, cheese, fermented cheese, meat, wool, hide etc to the nearby towns of Phongmey, Radhi, Rangjung and Tashigang. They also collect NWFPs to sell or barter for items that are not produced locally.

However, with the developmental activities taking place, such as road and electricity connectivity, the living standard of the communities has improved in many ways. There are also many local people exploring opportunities in casual labours, small scale business, government job, private employment and etc.

The agriculture farming in the lower valleys includes growing of cereal crops such as maize, buckwheat and barley. Vegetables consist of potato, cabbage, spinach, cauliflower, broccoli, radish and pumpkin both for the market and for self consumption.

People residing within SWS have been using the forest for various purposes since decades. Timber required for house construction, renovation, shingles and various other purposes were harvested from the forest and this practice is going to continue except shingles for roofing which has now been replaced by CGI sheets. In SWS, there are several unusual cases at Merak and Sakteng where the member of same family resides in two or more different houses but share the same *gung* number (house number). As per the Forest and Nature Conservation Rules and Regulations of Bhutan (FNCRR) 2017, only head of the *gung* is eligible for the rural timber whereas rest of the members are not entitled though they belong to different entity (*khejo*). This has led most of them to try to obtain separate *gung* number so as to make them possible to avail rural timber allocation. This will definitely add tremendous pressure on the timber resources in the region.

There are also several government sectors providing day to day service deliveries to the people residing in SWS. There are 29 service sectors in total. Sakteng has a total of 17 different service sectors, Merak has 8 and Joenkhar 4 (Table 14). Since these sectors falls within SWS jurisdiction, the management also needs to cater to the demand of natural resources like timber and firewood coming from them.

Table 14: Services sector in SWS

Sl.no	Service sectors	Merak	Sakteng	Joenkhar
1	Dungkhag Administration		1	
2	Dungkhag Court		1	
3	Gewog Administration	1	1	
4	Basic Health Unit	1	1	1
5	Police Station		1	
6	Lower Secondary School		1	
7	Primary School	1		1
8	Community Information Centre	1	1	
9	Extended Class Room		1	

10	Renewable Natural Resources Extension Centre	1	1	1
11	Bhutan Development Bank Limited		1	
12	Royal Insurance Corporation of Bhutan Limited		1	
13	Park Range Office	1	1	1
14	Park Guard Post		1	
15	Shedra (Buddhist Institute)		1	
16	Early Childhood Care & Development	1	1	
17	Out Reach Clinic		1	
18	Farm shop	1	1	
	Total	8	17	4

(Source: Merak and Sakteng Gewog Administration Office, 2019)

5. FUTURE MANAGEMENT

5.1 Management Option

There are various types of forest management options for each FMA in SWS. The main forest management option for Merak is timber use (40%) followed by improvement (23%), firewood (14%) and 3% were observed not feasible for any activity since the area was inoperable/inaccessible. Timber can be harvested mostly from compartments like C2 (Sakshum), C6 (Gasejab-Jangphutse) and C9 (Phrengla-Gomthe). Whereas in some areas, in compartment C11 (Khashiteng) and in sub-compartment of 1b, 3a, 4a, 5a, 5b, 5c and 8a (Figure 33 & 34), improvement activities like thinning and plantation needs to be carried out.

For Sakteng FMA, the dominating forest management option is firewood use (36%) followed by timber use (33%) and improvement (14%). As per the forest assessment survey, the timber are available in compartment C1 (Zhengtsegteng), C2 (Layphrangma), C8 (Mirkhe-throngbro) and C10 (Jabkangbro). The C2 next to Manirong requires thinning whereas some of the sub-compartments in C4 (Chunakpo) needs plantation. The firewood in Sakteng are abundant in C1 (Zhengtsegteng), C3 (Sangtengsa) and C5 (Pusa top) (Figure 35).

In Joenkhar FMA, the main forest management option is improvement (28%) followed by the firewood use (27%), no activity (27%), and least being timber use (19%). Here the firewood are mostly found in compartments C1 (Zhibreng-Tshengyem) and C4 (Kherilok-Tshonang). Some of the sub-compartment like 3i, 3j and 4g should be exempted from timber felling since the area falls on steep terrain and unstable and therefore, no activity should be carried out in these areas. The sub-compartments 2a (Tsemorong) and 2c (Broksarbo) under C2 (Tsemorong-Tsemotse) requires improvement activity, mainly with the plantation. The compartments C4 (Kherilok-Tshonang) and C5 (Moelamthung-Barmatse) are with good timber stocks for harvesting (Figure 36). Some of the sub-compartments at higher elevation with good stock are far from road point and human inhabitants, making them inaccessible for utilization.

The timber stocks which are near to settlements, connected by road and feasible for operation should be tended with proper improvement thinning and selective marking for extraction and proper monitoring should be in place. The timber for non-rural purposes permitted by the rules and regulations shall be allotted from the far away compartments. The compartments which are near the villages shall be given priority for the rural purpose only.

The distribution of management options throughout the FMAs are shown below (Figure 32). The management option for each individual sub compartment can be derived from annexure 13, 15 & 17.

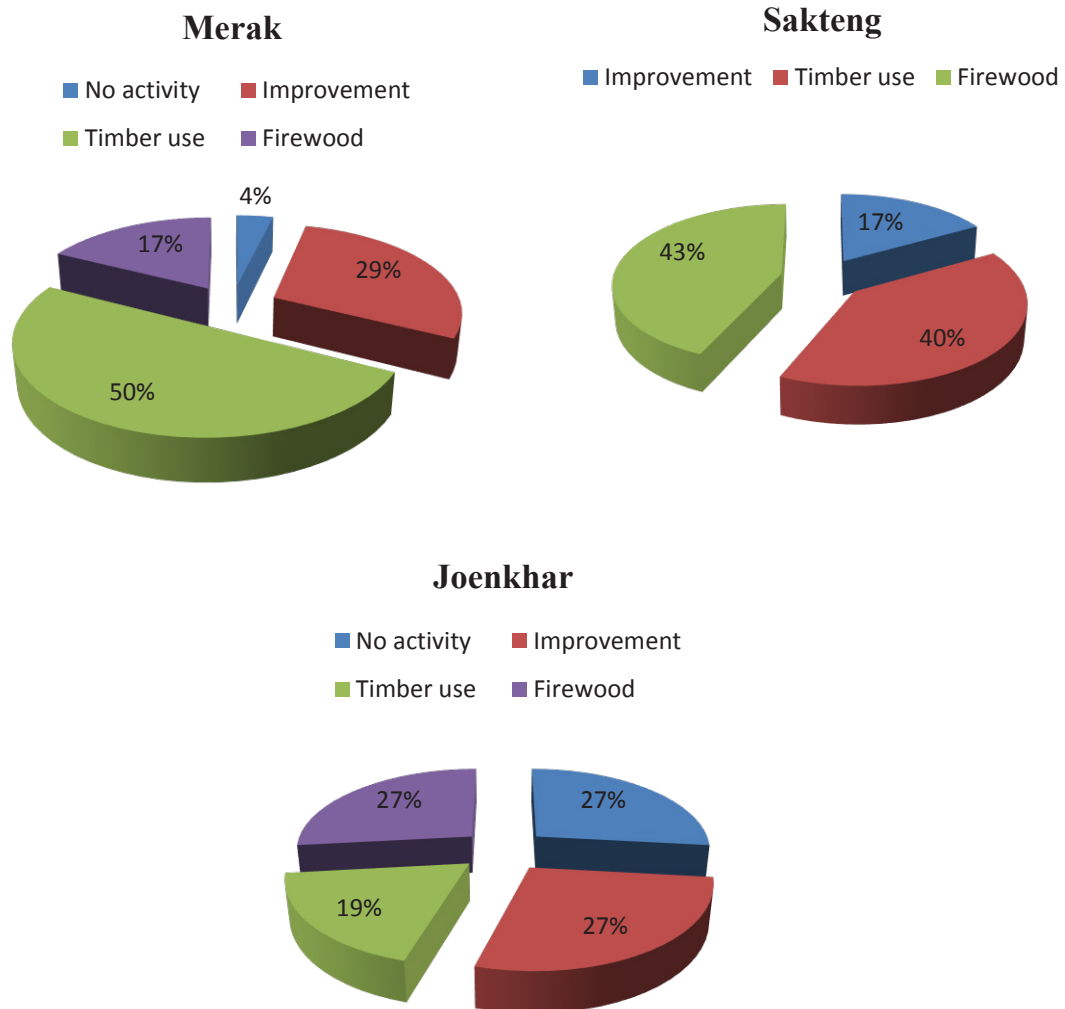


Figure 32: Management options

As a part of future management, Sanctuary should initiate conservation programs in the identified special protection zone to revive the degraded area and protect the habitat of flora and fauna. The regular patrolling must be in place to reduce the forest fire, illegal felling and girdling of the trees.

The periodic monitoring of the forests to check any outbreak of pest and diseases should be in place and continued. During the time of forest assessment, there was no record of pest and diseases outbreak. However, there is need for regular inspection conducted so that there is earliest initiation of possible remedial and preventive measures. The following are some of the control measures recommended:

- Regular assessment of regenerated areas and burning of infected plants after slashing and debarking.
- Periodic survey of the forest and removal of deformed trees.
- Need to have awareness program for the local people to report symptoms of the disease and pest outbreak in the forest.

Before supplying the saplings from the nursery, there should be thorough examination of the stock for pest and diseases. The infected seedlings should not be used, instead destroyed by burning at the nursery itself.

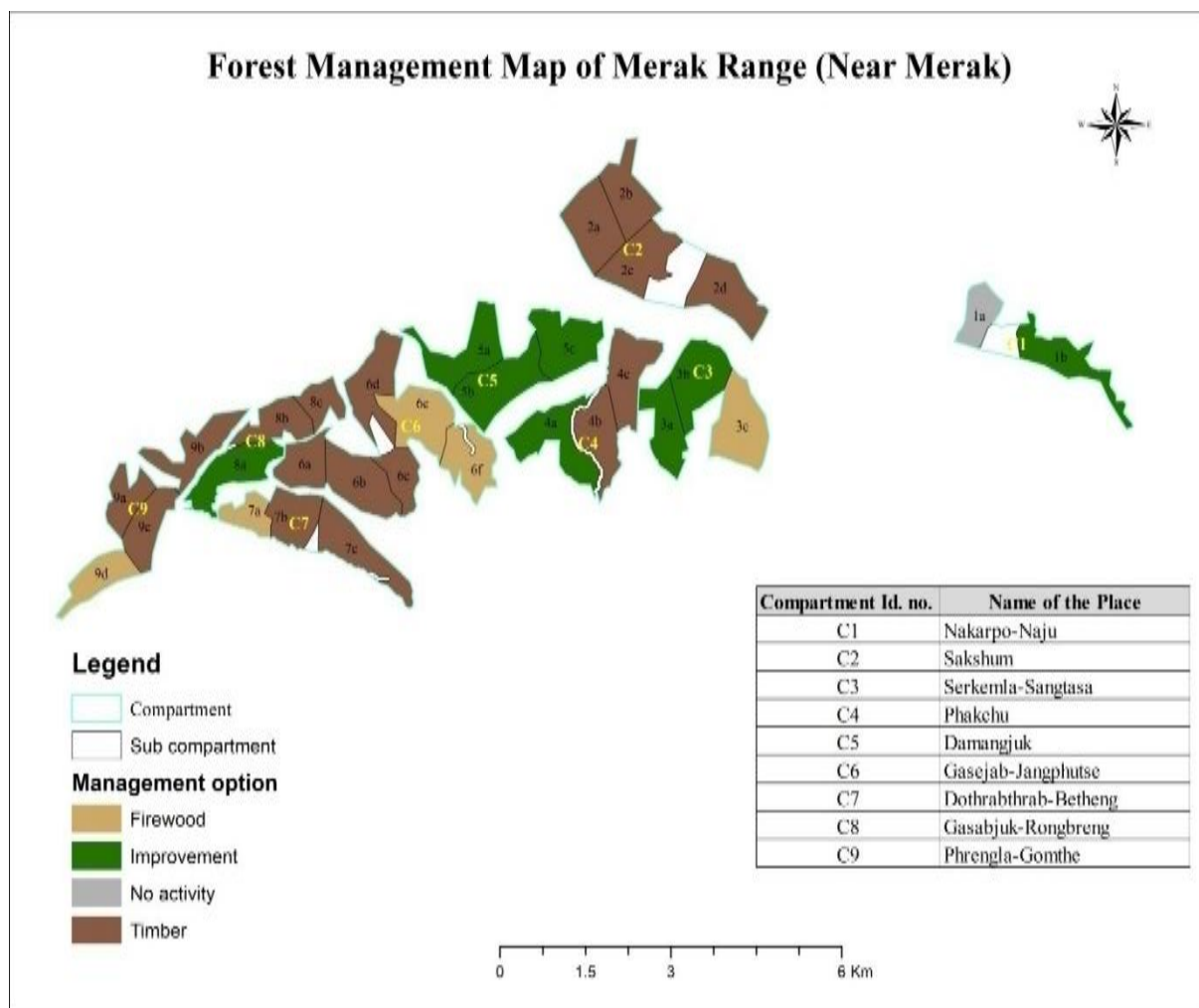


Figure 33: Forest management map of Merak

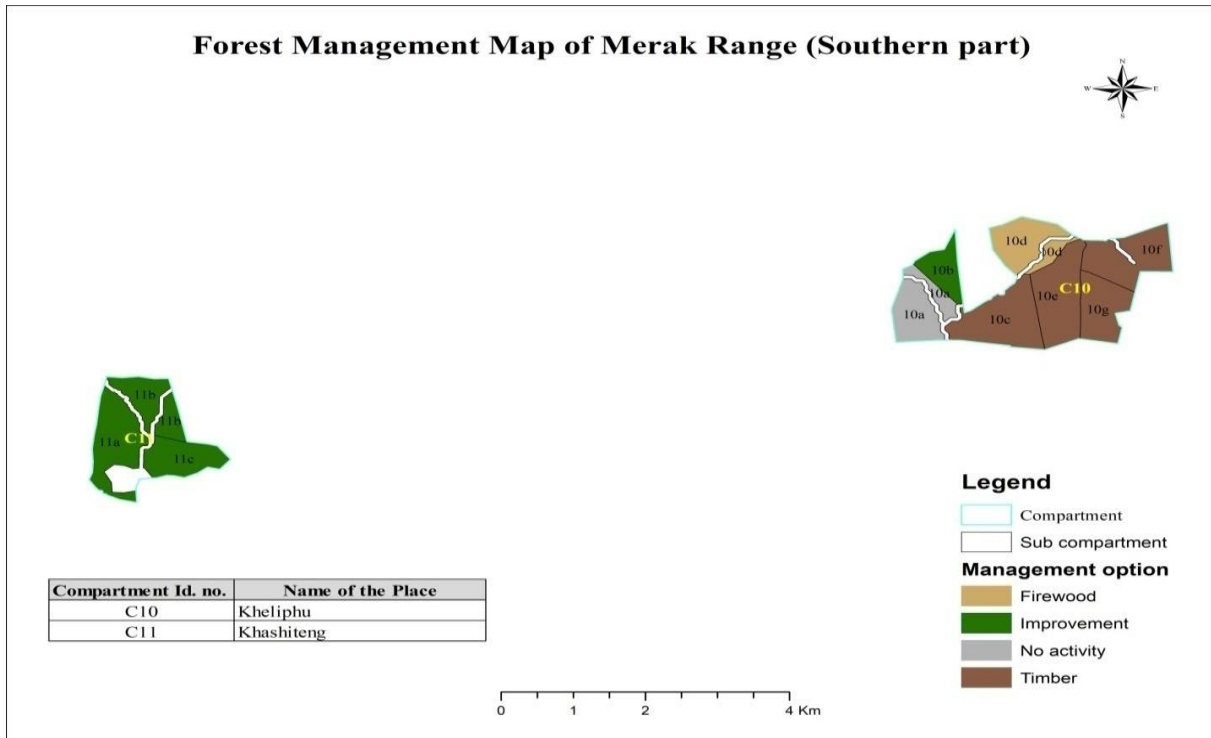


Figure 34: Forest management map of Merak (Southern part)

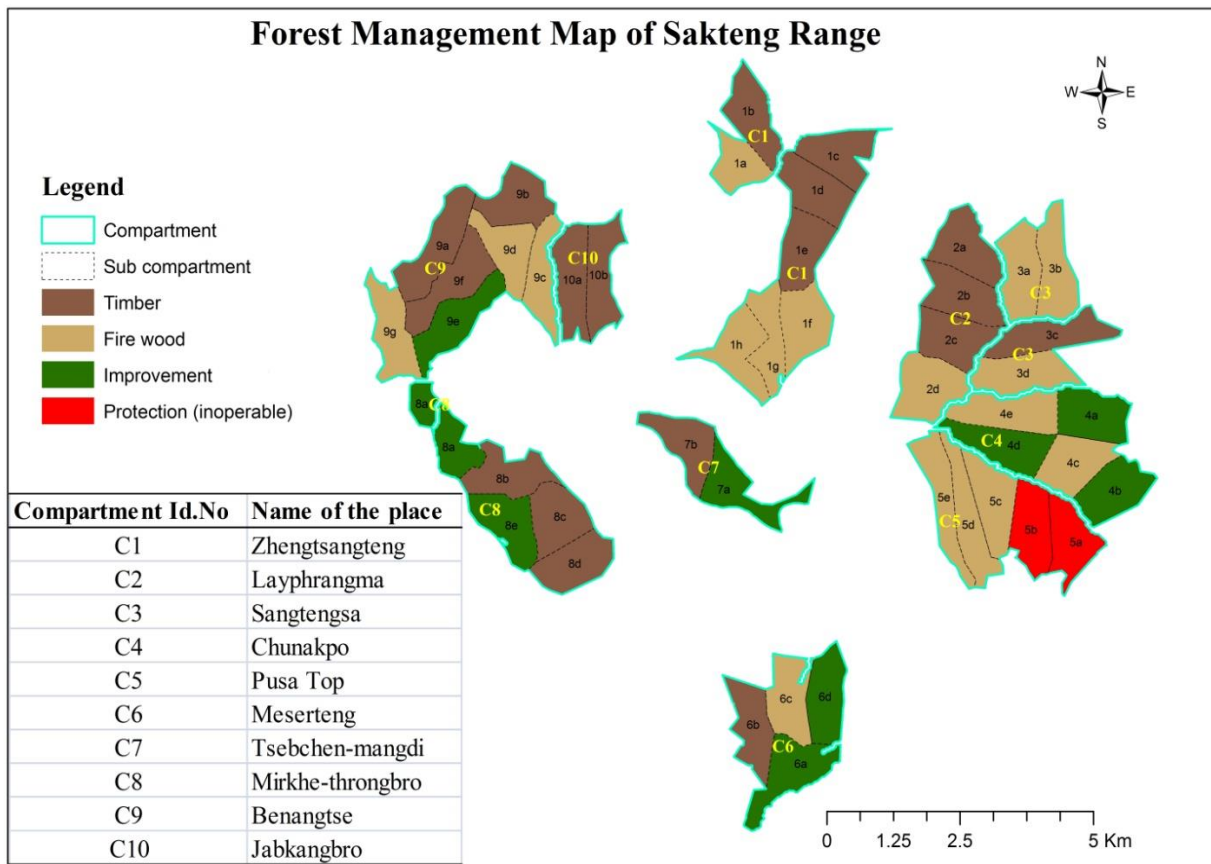


Figure 35: Forest management map of Sakteng

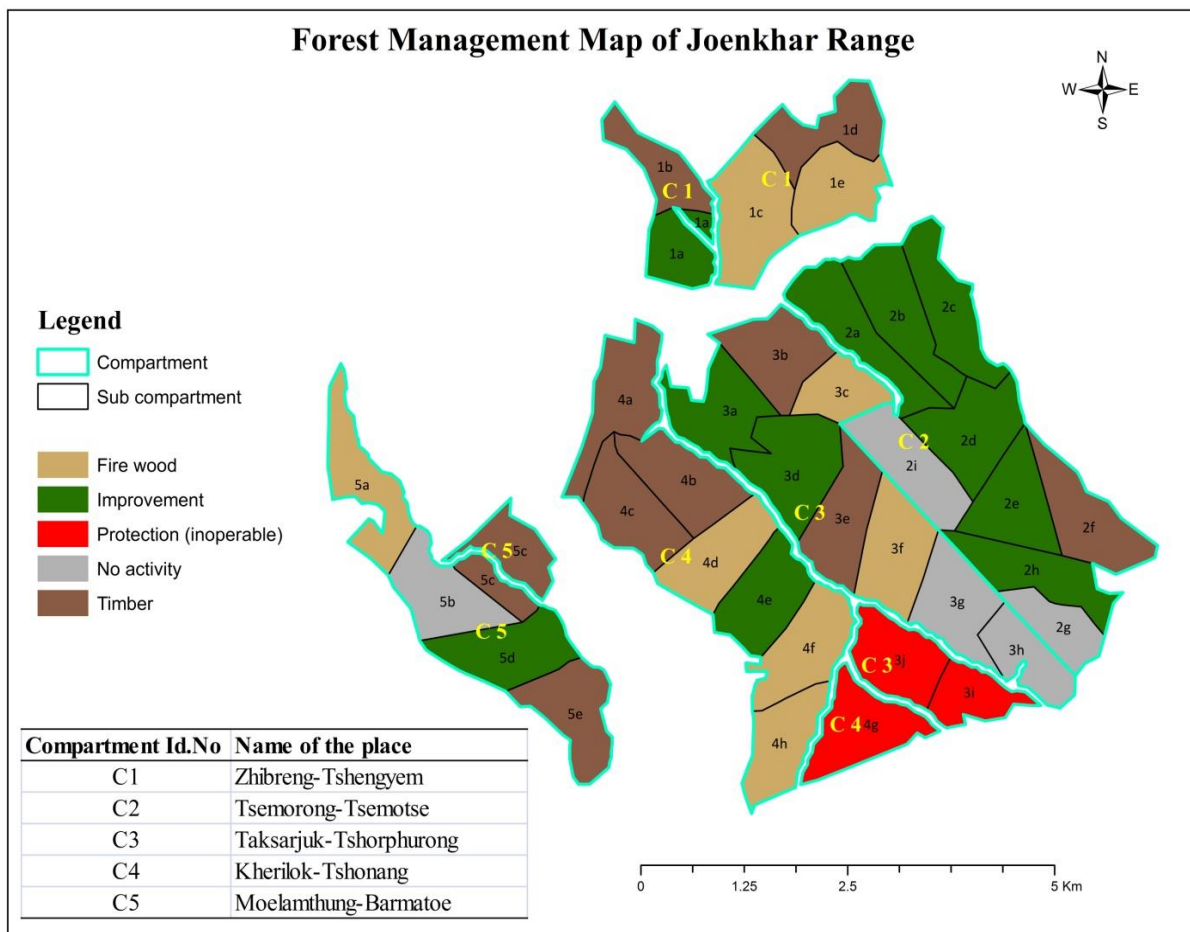


Figure 36: Forest management map of Joenkhar

5.2 Tree marking and silviculture

The tree marking should be done in accordance with the “Tree Marking Guidelines” and the “Silvicultural Guidelines” prescribed by the Department of Forests and Park Services.

The silvicultural system applied will be single tree selection system. The principle of negative selection will be applied in all tending and thinning operations. Single tree selection system removes the individual trees of all size classes more or less uniformly throughout the stand to maintain an uneven-aged stand. The felling should be scattered instead of confining to certain pockets of the forest.

The selection of trees to be felled should be done first for the following types;

- The dead, dying, diseased and defective trees which hinder with the growth of neighboring vegetation.
- The trees of undesirable species.
- The immature stands which can be removed by judicious thinning.
- The matured trees above the exploitable diameter, which will leave gaps for regeneration to come up.

Marking of mature trees for felling should be permitted only when the immediate vicinity is sufficiently regenerated and the regeneration can grow up. It is recommended that dead, dying,

deformed, and diseased trees which cannot be converted into construction timber should be marked for the purpose of firewood.

Grazing shall be controlled in all over-matured forests which are in the stage of natural regeneration. Un-stocked and sparsely stocked parts shall be re-planted with principal local species (species selection according to prevalent forest type).

6. YIELD REGULATION

The principle of sustained yield ensures the stability and continuous supply of raw materials to meet the needs of the people. The concept of sustained yield allows harvesting of forest resources by which annual cut and other losses of timber do not exceed the average annual growth. This will also help to ensure the continuity of harvest without damaging the productivity of the soil. The calculation of sustained yield is expressed as annual allowable cut (AAC).

6.1 Yield regulation of Merak FMA

The sustainable annual allowable cut $AAC_{sust.}$ for the management area is calculated as follows:

$$AAC_{sust.} = \text{total standing volume} / \text{average rotation period.} = 6121 \text{ m}^3/\text{year}$$

Taking into account the forest type distribution, the average production period for the forest management area is 119 years. The total standing volume is 831053.1 m^3 .

The overall production potential as determined by the forest resources assessment is 730296 m^3 . Dividing the overall production potential by the planning period of 10 years gives the silvicultural AAC:

$$AAC_{silv.} = \text{total production potential} / 10 \text{ years} = 73030 \text{ m}^3/\text{year}$$

As the $AAC_{sust.}$ is lower than the $AAC_{silv.}$ the AAC is fixed at the level of the $AAC_{sust.}$

The Annual Allowable Cut for the Merak forest management area is fixed at 6121 m^3 .

The AAC per ha for Merak FMA is 2.8 m^3 . Taking into account the fixed AAC of 6121 m^3 , the total production potential of the forest management area will be used in a period of about $730296/6121 = 119$ years.

6.2 Yield regulation of Sakteng FMA

$$AAC_{sust.} = \text{total standing volume} / \text{average rotation period.} = 5737 \text{ m}^3/\text{year}$$

Considering the forest type distribution, the average production period for the forest management area is 95 years. The total standing volume is 750829.4 m^3 .

The overall production potential as determined by the forest resources assessment is 545338 m^3 . Dividing the overall production potential by the planning period of 10 years gives the silvicultural AAC:

$$AAC_{silv.} = \text{total production potential} / 10 \text{ years} = 54534 \text{ m}^3/\text{year}$$

As the $AAC_{sust.}$ is lower than the $AAC_{silv.}$ the AAC is fixed at the level of the $AAC_{sust.}$

The Annual Allowable Cut for the Sakteng forest management area is fixed at 5737 m³.

The AAC per ha is 2.3 m³. Taking into account the fixed AAC of 5737 m³, the total production potential of the forest management area will be used in a period of about $545338/5737 = 95$ years.

6.3 Yield regulation of Joenkhar FMA

$AAC_{sust.} = \text{total standing volume} / \text{average rotation period} = 2449 \text{ m}^3/\text{year}$

Taking into account the forest type distribution, the average production period for the forest management area is 113 years. The total standing volume is 316082.7 m³.

The overall production potential as determined by the forest resources assessment is 276910 m³. Dividing the overall production potential by the planning period of 10 years gives the silvicultural AAC:

$AAC_{silv.} = \text{total production potential} / 10 \text{ years} = 27691 \text{ m}^3/\text{year}$

As the $AAC_{sust.}$ is lower than the $AAC_{silv.}$ the AAC is fixed at the level of the $AAC_{sust.}$

The Annual Allowable Cut for the Joenkhar forest management area is fixed at 2449 m³.

The AAC per ha is 1.6 m³. Taking into account the fixed AAC of 2449 m³, the total production potential of the forest management area will be used in a period of about $276910/2449 = 113$ years.

The in-charge of the respective ranges should carry out the effective monitoring and regulate the timber allotment as per the AAC to ensure the sustainability of the timber resources.

The priority for the timber allotment must be given to SWS inhabitants followed by outsiders based on the AAC.

7. DEMAND AND SUPPLY ASSESSMENT

7.1 Demand and supply assessment of rural timber

The rural timber demand of the respective ranges (excluding the extraordinary supply for e.g. *dzong* renovation, etc) has been calculated as the average of the actual rural timber allotment (FRDD, 2005) from 2012 to 2017. The data were derived from the rural subsidized timber record & forest information database of the concerned range office. The annual timber supply potential was calculated by dividing the total production potential (in number of trees) by the number of years it will take to use up the production potential with the fixed AAC.

Table 15: Demand and supply of rural timber**Merak range**

Product	Total Production Potential	Silvicult. Annual Potential	Sustainable Annual Supply Potential*	Annual Demand	Demand -Supply
<i>Drashing/shingleps</i>	30823	3082.3	259.02	510	-250.98
<i>Chams</i>	33962	3396.2	285.39	1200	-914.61
<i>Tsims</i>	51521	5152.1	432.95	950	-517.05
Poles	114914	11491.4	965.66	1119	-153.34

*Remark: the total production potential divided by 119 years

Sakteng range

Product	Total Production Potential	Silvicult. Annual Potential	Sustainable Annual Supply Potential*	Annual Demand	Demand - Supply
<i>Drashing/shingleps</i>	23994	2399.4	252.57	190	+62.57
<i>Chams</i>	44633	4463.3	469.82	292	+177.82
<i>Tsims</i>	77375	7737.5	814.47	277	+537.47
Poles	225219	22521.9	2370.73	1500	+870.73

*Remark: the total production potential divided 95 years

Joenkhar range

Product	Total Production Potential	Silvicult. Annual Potential	Sustainable Annual Supply Potential*	Annual Demand	Demand -Supply
<i>Drashing/shingleps</i>	4279	427.9	37.87	32	+5.87
<i>Chams</i>	15800	1580	139.82	62	+77.82
<i>Tsims</i>	14865	1486.5	131.55	71	+60.55
Poles	33129	3312.9	293.18	377	- 83.82

*Remark: the total production potential divided 113 years

As per the demand and supply assessment, Merak FMA was falling short of all the timber products like *drashing*, *cham*, *tsim* and poles which need to be met from other sources. Sakteng FMA has sufficient timber products for the planning period of 10 years as per the assessment. For Joenkhar, the timber products like *drashing*, *cham* and *tsim* can be supplied sufficiently for the planning period (Table 15). However, there is a shortage for poles which can be compensated by the surplus of the larger trees (yield is controlled in terms of volume).

To meet the shortage of timber at Merak, SWS management should find the alternative means to meet the gap. The allotment of surplus timber stock from Sakteng and Joenkhar FMA is recommended to fill the supply gap. Sanctuary should also work in collaboration with the neighbouring territorial division to explore measures to deal with the timber demand.

7.2 Demand and supply assessment of firewood

The firewood demand was calculated in truckloads. To compare it with the supply potential, it was converted into standing volume equivalent. The conversion factor applied was:

1 truckload is equivalent to 8 m³ standing volume.

Table 16: Demand and supply of firewood

FMA	Total Production Potential (Volume _{tot})	Annual Supply Potential*	Annual Demand	Demand - Supply
Merak	420283	3531.79	2688	+843.79
Sakteng	289979	3052.41	3040	+12.41
Joenkhar	235809	2086.81	760	+1326.81

*Remarks: The total production potential divided by 119 years (Merak), 95 years (Sakteng) 113 years (Joenkhar).

The annual supply potentials for all FMAs are considerably higher than the average annual demand of firewood of the last 10 years (Table 16). Whenever possible the firewood demand of one village should be allotted from the corresponding compartment. The dead, deformed and diseased trees which are not useful for construction should be allotted as firewood to save the sound timber.

Quercus sp. and *Rhododendron* sp. are some of the most preferred fuel wood species extracted by the local people. If this trend continues, it may lead to the loss of the species in near future (Yangdon et al., 2017). The tactic to increase the growth and production of these species were felt necessary in addition to planting of other tree species having high calorific value. The alternative measures like electric cookers can be supplied to the schools and institutions in order to minimize the fuel wood consumption since these institutes also contribute to the utilization of huge volume of fuel wood. The management should also explore other possible alternatives, such as biogas and solar energy, for cooking and lighting.

8. MONITORING

Monitoring is a continuous/periodic review undertaken by management at every stage of the execution of an activity to ensure that the required actions are carried out according to the plan.

Effective monitoring is essential for the control of AAC. Each tree, which is marked for felling must be recorded in the tree marking book with specific geo-coordinates. Annual monitoring will be carried out by SWS management. A report will be submitted to FRMD, DoFPS, Ministry of Agriculture and Forests using the annual monitoring forms. FRMD will monitor the implementation of these activities. The evaluation of the plan will be carried out at the mid-term and at the end of the plan period.

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Annexure 11: Summary Results of three Forest Management Areas

Summary Results for Forest Management Area: Merak

Unit	Area Distribution					Average basal area (m ² /ha)	Aver. Stand Volume (m ³ /ha)	No of operable sample plots
	Non Forest	Protection	Inoperable	Production	Total			
ha	141.1	98.9	908.7	2185.1	3333.8	18.9	380	684
%	4%	3%	27%	66%	100%			

Unit	Forest Type Distribution									
	Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total	
%	3%	66%	0%	7%	0%	0%	22%	2%	100%	
Unit	Age distribution					Stand type distribution				
	young	immature	mature	Overmature	Total	plantation	natural	coppice	Total	
%	9%	17%	55%	19%	100%	0%	100%	0%	100%	
Unit	Canopy closure					Condition				
	dense	closed	open	unstocked	Total	good	average	poor	Total	
%	8%	42%	42%	9%	100%	26%	56%	18%	100%	

Unit	Site Condition										
	Slope			Erosiveness			Soil Cover				
	gentle	moderate	steep	stable	moderate	unstable	high	moderate	low		
%	21%	50%	29%	49%	46%	6%	26%	57%	17%		

Unit	Forest Use					
	Intensive Side Uses			Extensive Side Uses		
	grazing	sokshing	lopping	grazing	sokshing	lopping
ha	555.2	0.0	177.1	1338.2	0.0	135.8
%	25%	0%	8%	61%	0%	6%

Unit	NWFP Occurrence and Firewood							
	NWFP abundant				NWFP sparse			
	Firewood	Bamboo	Cane	Daphne	Firewood	Bamboo	Cane	Daphne
ha	751.4	165.6	3.0	48.8	1222.7	295.5	7.7	228.3
%	34%	8%	0%	2%	56%	14%	0%	10%

Unit	Management Options					
	No activity	Improv.	Timber	Firewood	Silvopast.	Shokshing
ha	56.3	506.5	871.5	298.1	0.0	0.0
%	3%	23%	40%	14%	0%	0%

Unit	Potential Production				
	Timber				
	Drashing	Cham	Tsim	Poles,posts	Total
Ntot	30823	33962	51521	114914	231220
N/ha	14	16	24	53	106
m ³	242891	34802	19474	12846	310013
m ³ /ha	111.2	15.9	8.9	5.9	141.9
Unit	Firewood				Total
	> 49cm	30-49cm	20-29 cm	10-19 cm	
Ntot	41939	31773	65030	342245	480987
N/ha	19	15	30	157	220
m ³	339350	33851	21773	25309	420283
m ³ /ha	155.3	15.5	10.0	11.6	192.3

Unit	Sivicultural Measures			
	Planting	Thinning	Felling	
ha	259.5	757.1	1001.9	0.0
%	12%	35%	46%	0%

Yield Regulation	
AAC	6121 m ³
	2.8 m ³ /ha
Prod. Potential / AAC	119 years

Summary Results for Forest Management Area: Sakteng

Unit	Area Distribution				
	Non Forest	Protection	Inoperable	Production	Total
ha	386.2	146.3	1281.3	2521.5	4335.3
%	9%	3%	30%	58%	100%

Average basal area (m ² /ha)	Aver. Stand Volume (m ³ /ha)	No of operable sample plots
22.1	298	722

Unit	Forest Type Distribution									
	Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total	
%	1%	51%	0%	18%	1%	0%	6%	23%	100%	
Unit	Age distribution					Stand type distribution				
	young	immature	mature	Overmature	Total	plantation	natural	coppice	Total	
%	7%	16%	68%	9%	100%	0%	100%	0%	100%	
Unit	Canopy closure					Condition				
	dense	closed	open	unstocked	Total	good	average	poor	Total	
%	7%	48%	37%	8%	99%	18%	73%	10%	100%	

Unit	Site Condition								
	Slope			Erosiveness			Soil Cover		
	gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
%	14%	60%	26%	18%	67%	14%	8%	78%	15%

Unit	Forest Use					
	Intensive Side Uses			Extensive Side Uses		
	grazing	sokshing	lopping	grazing	sokshing	lopping
ha	875.8	0.0	196.4	1164.0	0.0	445.5
%	35%	0%	8%	46%	0%	18%

Unit	NWFP Occurrence and Firewood							
	NWFP abundant				NWFP sparse			
	Firewood	Bamboo	Cane	Daphne	Firewood	Bamboo	Cane	Daphne
ha	615.2	334.2	3.9	240.1	1397.0	362.3	36.8	420.6
%	24%	13%	0%	10%	55%	14%	1%	17%

Unit	Management Options					
	No activity	Improv.	Timber	Firewood	Silvopast.	Shokshing
	ha	0.0	361.8	839.1	909.4	0.0
%	0%	14%	33%	36%	0%	0%

Unit	Potential Production				
	Timber				
	Drashing	Cham	Tsim	Poles,posts	Total
Ntot	23994	44633	77375	225219	371221
N/ha	10	18	31	89	147
m ³	163964	46274	25868	19253	255359
m ³ /ha	65.0	18.4	10.3	7.6	101.3
Unit	Firewood				
	> 49cm	30-49cm	20-29 cm	10-19 cm	Total
	Ntot	26947	38643	97678	366421
N/ha	11	15	39	145	210
m ³	201138	33812	29147	25882	289979
m ³ /ha	79.8	13.4	11.6	10.3	115.0

Unit	Sivicultural Measures			
	Planting	Thinning	Felling	
ha	222.8	1187.8	701.4	0.0
%	9%	47%	28%	0%

Yield Regulation	
AAC	5737 m ³
Prod. Potential / AAC	2.3 m ³ /ha
	95 years

Summary Results for Forest Management Area: Joenkhar

Unit	Area Distribution				
	Non Forest	Protection	Inoperable	Production	Total
ha	237.5	215.4	1242.1	1544.5	3239.5
%	7%	7%	38%	48%	100%

Average basal area (m ² /ha)	Aver. Stand Volume (m ³ /ha)	No of operable sample plots
16.9	205	457

Unit	Forest Type Distribution								
	Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total
%	0%	8%	0%	4%	0%	0%	74%	13%	100%

Unit	Age distribution					Stand type distribution			
	young	immature	mature	Overmature	Total	plantation	natural	coppice	Total
%	6%	19%	71%	5%	100%	0%	100%	0%	100%

Unit	Canopy closure					Condition			
	dense	closed	open	unstocked	Total	good	average	poor	Total
%	14%	52%	26%	8%	100%	28%	64%	8%	100%

Unit	Site Condition								
	Slope			Erosiveness			Soil Cover		
	gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
%	19%	48%	33%	36%	59%	5%	23%	67%	10%

Unit	Forest Use					
	Intensive Side Uses			Extensive Side Uses		
	grazing	sokshing	lopping	grazing	sokshing	lopping
ha	387.4	0.0	157.1	1102.1	0.0	415.6
%	25%	0%	10%	71%	0%	27%

Unit	NWFP Occurrence and Firewood							
	NWFP abundant				NWFP sparse			
	Firewood	Bamboo	Cane	Daphne	Firewood	Bamboo	Cane	Daphne
ha	306.2	331.4	0.0	176.8	1192.3	509.7	0.0	595.9
%	20%	21%	0%	11%	77%	33%	0%	39%

Unit	Management Options					
	No activity	Improvment	Timber	Firewood	Silvopast.	Shokshing
	ha	415.9	435.9	295.6	415.3	0.0
%	27%	28%	19%	27%	0%	0%

Unit	Potential Production				
	Timber				
	Drashing	Cham	Tsim	Poles, posts	Total
Ntot	4279	15800	14865	33129	68073
N/ha	3	10	10	21	44
m ³	19162	14872	4510	2557	41101
m ³ /ha	12.4	9.6	2.9	1.7	26.6

Unit	Firewood				
	> 49cm	30-49cm	20-29 cm	10-19 cm	Total
Ntot	22801	48598	67834	143330	282563
N/ha	15	31	44	93	183
m ³	139768	62253	21526	12262	235809
m ³ /ha	90.5	40.3	13.9	7.9	152.7

Unit	Sivicultural Measures			
	Planting	Thinning	Felling	
	ha	69.0	691.5	415.8
%	4%	45%	27%	0%

Yield Regulation	
AAC	2449 m ³
Prod. Potential / AAC	1.6 m ³ /ha
	113 years

Annexure 12: Compiled Results by Compartment for Merak FMA

Area Distribution, Basal Area and No. of Sample Plots for Forest Management Area: **Merak**

Comp	Sub-Compartment		Area Distribution (ha)					BA (m ² /ha)	No. of Plots
	No.	Name	Non Forest Area	Protection	Inoperable	Production	Total		
1	1a	Nakarpo	2.9	0.3	11.9	35.6	50.7	6.7	15
1	1b	Naju	9.1	0.8	39.1	42.4	91.4	23.4	13
2	2a	Wongor jab	1.1	1.7	27.4	70.5	100.7	16.3	18
2	2b	Wongor jab 2	5.6	5.6	20.6	52.9	84.7	16.3	18
2	2c	Sakshum	11.5	0.4	24.9	60.6	97.4	19.8	17
2	2d	Dungmera-Charam	0.5	2.7	19.2	77	99.4	12.5	20
3	3a	Sangtasa	0.6	3.2	9	65.9	78.7	18.5	22
3	3b	Serkemla	0.3	4.5	15	79	98.8	26.1	21
3	3c	Serkemla 2	0.2	6.2	32.6	69.9	108.9	28.3	15
4	4a	Phakchu	2.3	0.8	19.6	78.5	101.2	44.9	20
4	4b	Marzonjab	1.3	1.4	30.3	45.5	78.5	45.9	15
4	4c	Marteng	1.1	5.5	21.2	67.3	95.1	24.7	19
5	5a	Damangjuk	11.2	0.5		88.6	100.3	17.4	20
5	5b	Damangjuk 2	3	2.4	17.2	90.3	112.9	23.5	21
5	5c	Tshega	1.6	2.1	19.5	78.1	101.3	26.4	20
6	6a	Gase-Lithejab 2	0.6	0.3	27.7	35.3	63.9	18	14
6	6b	Gasejab-Marzong		1.1	35.7	63.4	100.2	20.3	16
6	6c	Gasejab-Marzong 2		2.8	17.3	30.8	50.9	20.1	16
6	6d	Lepchungnang-songr	4.7	0.8	11.2	82.5	99.2	13.2	22
6	6e	Nimdroma-Maejung	0.1	1.8	34.9	62.1	98.9	29.8	16
6	6f	Melung-Jangphutse		3.4	42.6	33.5	79.5	15.5	11
7	7a	Lethe-Sumthengjug		0.4	29.5	12.6	42.5	13.7	6
7	7b	Gase-Lithejab	1.5	1.3	29.8	37.9	70.5	18	14
7	7c	Dothrabthrab-Betheng	1.2	1.2	33.7	59.9	96	22.6	16
8	8a	Gasabjuk		7.8	79.6	3.3	90.7	26	1
8	8b	Sazur		1	31.3	33.9	66.2	18.3	13
8	8c	Rongbrenng	1.5		14.6	27.1	43.2	19.7	13
9	9a	Donglo	9.2	1.4	11.6	34.7	56.9	14.7	15
9	9b	Gomthe	9.9	2.8	27.9	41.8	82.4	14.8	15
9	9c	Nangchenma	3.3	4.2	24.8	37.3	69.6	14.4	15
9	9d	Phrenglateng	5.7	0.9	22.5	33.8	62.9	17.3	15
10	10a	Panglem Breng	0.2	7.1	19.5	50.1	76.9	8.2	18
10	10b	Jatasa	8.3	5.9		25.8	40	5.5	15
10	10c	Labtsa Khandronanag	8		7.5	86.3	101.8	12.3	23
10	10d	Tagaisa-thsezur	4.9	10.1	18.9	40.2	74.1	9.9	17
10	10e	Phromshing-Bompo		1	3.9	93	97.9	6.2	24
10	10f	Phrrangmoteng	2.4	0.6	13.8	72.3	89.1	13	21
10	10g	Arkelamo-Moshimoju	0.5			67.4	67.9	12.1	25
11	11a	Gaytay-Shushulaga	8.9	2.8	27.7	49.2	88.6	14.4	16
11	11b	Chumagpo	10.6	2.1	17.5	31.1	61.3	14.5	16
11	11c	Khashiteng	7.3		17.7	37.7	62.7	12.1	17

Comp	Sub-Compartment		Area Distribution (ha)					BA (m ² /ha)	No. of Plots
	No.	Name	Non Forest Area	Protection	Inoperable	Production	Total		
1		Nakarpo-Naju	12	1.1	51	78	142.1	15.8	28
2		Sakshum	18.7	10.4	92.1	261	382.2	16.0	73
3		Serkemla-Sangtasa	1.1	13.9	56.6	214.8	286.4	24.5	58
4		Phakchu	4.7	7.7	71.1	191.3	274.8	38.0	54
5		Damangjuk	15.8	5	36.7	257	314.5	22.3	61
6		Gasejab-Jangphutse	5.4	10.2	169.4	307.6	492.6	19.5	95
7		Dothrabthrab-Betheng	2.7	2.9	93	110.4	209	20.0	36
8		Gasabjuk-Rongbrenng	1.5	8.8	125.5	64.3	200.1	19.3	27
9		Phrengla-Gomthe	28.1	9.3	86.8	147.6	271.8	15.2	60
10		Kheliphu	24.3	24.7	63.6	435.1	547.7	10.0	143
11		Khashiteng	26.8	4.9	62.9	118	212.6	13.7	49
Total			141.1	98.9	908.7	2185.1	3333.8	18.9	684

Stand Data of Forest Management Area: Merak

Comp No.	Sub-Compartment No.	Name	Production area (ha)	Basal Area (m ² /ha)	Volume (m ³ /ha)	Tot. Volume (m ³)	V conifer (%)
1	1a	Nakarpo	35.6	6.7	155.0	5518.0	99.0
1	1b	Naju	42.4	23.4	243.8	10337.1	100.0
2	2a	Wongor jab	70.5	16.3	344.5	24287.3	86.0
2	2b	Wongor jab 2	52.9	16.3	344.5	18224.1	86.0
2	2c	Sakshum	60.6	19.8	456.8	27682.1	95.0
2	2d	Dungmera-Charam	77.0	12.5	264.6	20374.2	99.0
3	3a	Sangtasa	65.9	18.5	309.5	20396.1	81.0
3	3b	Serkemla	79.0	26.1	382.0	30178.0	82.0
3	3c	Serkemla 2	69.9	28.3	748.6	52327.1	90.0
4	4a	Phakchu	78.5	44.9	588.8	46220.8	89.0
4	4b	Marzonjab	45.5	45.9	524.0	23842.0	79.0
4	4c	Marteng	67.3	24.7	469.8	31617.5	87.0
5	5a	Damagjuk	88.6	17.4	467.3	41402.8	90.0
5	5b	Damangjuk 2	90.3	23.5	501.2	45258.4	90.0
5	5c	Tshega	78.1	26.4	541.3	42275.5	88.0
6	6a	Gase-Lithejab 2	35.3	18.0	314.0	11084.2	94.0
6	6b	Gasejab-Marzong	63.4	20.3	186.4	11817.8	96.0
6	6c	Gasejab-Marzong 2	30.8	20.1	185.4	5710.3	96.0
6	6d	Lepchungnang-songr	82.5	13.2	274.8	22671.0	94.0
6	6e	Nimdrorna-Maejung	62.1	29.8	740.0	45954.0	95.0
6	6f	Melung-Jangphutse	33.5	15.5	124.7	4177.5	88.0
7	7a	Lethe-Sumthengjug	12.6	13.7	214.3	2700.2	89.0
7	7b	Gase-Lithejab	37.9	18.0	314.0	11900.6	94.0
7	7c	Dothrabthrab-Betheng	59.9	22.6	215.7	12920.4	93.0
8	8a	Gasabjuk	3.3	26.0	232.6	767.6	72.0
8	8b	Sazur	33.9	18.3	659.1	22343.5	93.0
8	8c	Rongbreng	27.1	19.7	956.7	25926.6	96.0
9	9a	Donglo	34.7	14.7	461.7	16021.0	95.0
9	9b	Gomthe	41.8	14.8	433.7	18128.7	98.0
9	9c	Nangchenma	37.3	14.4	825.3	30783.7	97.0
9	9d	Phrenglateng	33.8	17.3	400.0	13520.0	90.0
10	10a	Panglem Breng	50.1	8.2	233.6	11703.4	1.0
10	10b	Jatasa	25.8	5.5	243.8	6290.0	0.0
10	10c	Labtsa Khandronanag	86.3	12.3	75.3	6498.4	0.0
10	10d	Tagaisa-thsezur	40.2	9.9	71.3	2866.3	0.0
10	10e	Phromshing-Bompo	93.0	6.2	531.2	49401.6	0.0
10	10f	Phrangmoteng	72.3	13.0	513.0	37089.9	0.0
10	10g	Arkelamo-Moshimoju	67.4	12.1	96.4	6497.4	0.0
11	11a	Gaytay-Shushulaga	49.2	14.4	107.7	5298.8	0.0
11	11b	Chumagpo	31.1	14.5	133.8	4161.2	0.0
11	11c	Khashiteng	37.7	12.1	129.4	4878.4	0.0

Compartment	Production area (ha)	Basal Area (m ² /ha)	Volume (m ³ /ha)	Tot. Volume (m ³)	V conifer (%)
1 Nakarpo-Naju	78.0	15.8	203.3	15855.1	99.5
2 Sakshum	261.0	16.0	347.0	90567.6	91.9
3 Serkemla-Sangtasa	214.8	24.5	479.1	102901.2	84.3
4 Phakchu	191.3	38.0	531.5	101680.3	85.9
5 Damangjuk	257.0	22.3	501.7	128936.7	89.4
6 Gasejab-Jangphutse	307.6	19.5	329.7	101414.7	94.2
7 Dothrabthrab-Betheng	110.4	20.0	249.3	27521.2	92.9
8 Gasabjuk-Rongbreng	64.3	19.3	762.6	49037.6	93.2
9 Phrengla-Gomthe	147.6	15.2	531.5	78453.3	95.2
10 Kheliphu	435.1	10.0	276.6	120346.9	0.1
11 Khashiteng	118.0	13.7	121.5	14338.4	0.0
Total	2185.1	18.9	380.3	831053.1	68.0

Forest Type Distribution in Forest Management Area of: Merak

Comp	Sub-Compartment		Prod. Area (ha)	Forest Type Distribution (in ha)								
	No.	Name		Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total
1	1a	Nakarpo	35.6		11.7		23.9					11.7
1	1b	Naju	42.4		32.6		9.8					6.4
2	2a	Wongor jab	70.5		66.3		4.2					
2	2b	Wongor jab 2	52.9		49.7		3.2					
2	2c	Sakshum	60.6		49.7		10.9					3.6
2	2d	Dungmera-Charam	77		38.5		38.5					11.6
3	3a	Sanglasa	65.9		65.9							5.9
3	3b	Serkemla	79		79.0							7.9
3	3c	Serkemla 2	69.9		65.0		4.9					4.9
4	4a	Phakchu	78.5		78.5							
4	4b	Marzorjab	45.5		45.5							
4	4c	Marleng	67.3		67.3							17.5
5	5a	Damangjuk	88.6		88.6							4.4
5	5b	Damangjuk 2	90.3		90.3							9.0
5	5c	Tshega	78.1		74.2		3.9					3.9
6	6a	Gase-Lithejab 2	35.3		30.4					4.9		4.9
6	6b	Gasejab-Marzong	63.4		43.7		19.7					
6	6c	Gasejab-Marzong 2	30.8		23.1		7.7					
6	6d	Lepchungnang-songr	82.5		52.8		11.6			19.0		7.4
6	6e	Nimndroma-Maejung	62.1		62.1							8.1
6	6f	Melung-Jangphutse	33.5		33.5							
7	7a	Lethe-Sumthengjug	12.6		4.2		6.3			2.1		2.1
7	7b	Gase-Lithejab	37.9		32.6					5.3		5.3
7	7c	Dothrabthrab-Betheng	59.9		48.5					11.4		
8	8a	Gasabjuk	3.3	3.3								
8	8b	Sazur	33.9		33.9							5.1
8	8c	Rongbreng	27.1		27.1							8.4
9	9a	Donglo	34.7	11.5	18.4				2.4	2.4		4.5
9	9b	Gomthe	41.8	36.4	5.4							2.9
9	9c	Nangchenma	37.3	19.8	12.3				4.8			
9	9d	Phrenglateng	33.8	4.4	29.4							
10	10a	Panglem Breng	50.1						50.1			5.5
10	10b	Jatasa	25.8						25.8			1.8
10	10c	Labisa Khandronanag	86.3		86.3							3.5
10	10d	Tagaisa-thsezur	40.2						40.2			2.4
10	10e	Phromshing-Bompo	93						93.0			7.4
10	10f	Phrangmoteng	72.3						72.3			3.6
10	10g	Arkelamo-Moshimoju	67.4						67.4			
11	11a	Gaylay-Shushulaga	49.2						49.2			9.3
11	11b	Chumagpo	31.1						31.1			
11	11c	Khashiteng	37.7						37.7			24.5

Compartment	Prod. Area (ha)	Forest Type Distribution (in ha)								Total
		Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	
1 Nakarpo-Naju	78.0		57%		43%					100%
2 Sakshum	261.0		78%		22%					100%
3 Serkemla-Sanglasa	214.8		98%		2%					100%
4 Phakchu	191.3		100%							100%
5 Damangjuk	257.0		98%		2%					100%
6 Gasejab-Jangphutse	307.6		80%		13%			8%		100%
7 Dothrabthrab-Betheng	110.4		77%		6%			17%		100%
8 Gasabjuk-Rongbreng	64.3	5%	95%							100%
9 Phrengla-Gomthe	147.6	49%	44%					5%	2%	100%
10 Kheliphu	435.1		20%					80%		100%
11 Khashiteng	118.0							100%		100%
Total	2185.1	3%	66%		7%			22%	2%	100%

Canopy Closure and Condition of Forest Management Area of: Merak

Comp No.	Sub-Compartment		Prod. Area (ha)	Canopy closure (ha)					Condition (ha)			
	No.	Name		dense	closed	open	unstocked	Total	good	average	poor	Total
1	1a	Nakarpo	35.6	2.5	4.6	16.7	11.7	35.6	2.5	28.5	4.6	35.6
1	1b	Naju	42.4		9.8	22.9	9.8	42.4	13.1	19.5	9.8	42.4
2	2a	Wongor jab	70.5		4.2	55.0	12.0	71.2		62.7	7.8	70.5
2	2b	Wongor jab 2	52.9		3.2	41.3	9.0	53.4		47.1	5.8	52.9
2	2c	Sakshum	60.6	3.6	7.3	46.1	3.6	60.6	14.5	46.1		60.6
2	2d	Dungmera-Charam	77		11.6	38.5	27.0	77.0	7.7	69.3		77.0
3	3a	Sanglasa	65.9	15.2	38.9	9.2	3.3	66.6	17.8	15.2	33.0	65.9
3	3b	Serkemla	79	19.0	45.0	11.1	4.0	79.0	22.9	19.0	37.9	79.8
3	3c	Serkemla 2	69.9	9.1	32.9	18.9	9.1	69.9	14.0	9.1	46.8	69.9
4	4a	Phakchu	78.5		58.9	11.8	7.9	78.5	19.6	43.2	15.7	78.5
4	4b	Marzonjab	45.5	9.1	30.5	5.9		45.5	21.4	15.0	9.1	45.5
4	4c	Marleng	67.3	28.3	35.7	3.4		67.3	35.7	17.5	14.1	67.3
5	5a	Damangjuk	88.6		17.7	39.9	31.0	88.6	4.4	31.0	53.2	88.6
5	5b	Damangjuk 2	90.3	17.2	73.1			90.3	38.8	29.8	21.7	90.3
5	5c	Tshega	78.1	3.9	58.6	15.6		78.1	19.5	23.4	35.1	78.1
6	6a	Gase-Lithejab 2	35.3	2.5	17.7	15.2		35.3	12.7	17.7	4.9	35.3
6	6b	Gasejab-Marzong	63.4	3.8	39.9	19.7		63.4	8.2	51.4	3.8	63.4
6	6c	Gasejab-Marzong 2	30.8	1.8	19.4	9.5		30.8	4.0	24.9	1.8	30.8
6	6d	Lepchungnang-songr	82.5	4.1	19.0	56.1	4.1	83.3	4.1	56.1	22.3	82.5
6	6e	Nimdroma-Maejung	62.1		34.8	27.3		62.1	8.1	46.6	8.1	62.7
6	6f	Melung-Jangphutse	33.5		18.4	15.1		33.5		33.5		33.5
7	7a	Lethe-Sumthengjug	12.6		8.4	2.1	2.1	12.7	4.2	6.3	2.1	12.6
7	7b	Gase-Lithejab	37.9	2.7	19.0	16.3		37.9	13.6	19.0	5.3	37.9
7	7c	Dothrabilhrab-Belheng	59.9	15.0	44.9			59.9	37.7	22.8		60.5
8	8a	Gasabjuk	3.3		3.3			3.3		3.3		3.3
8	8b	Sazur	33.9	7.8	12.9	12.9		33.6	15.6	15.6	2.7	33.9
8	8c	Rongbreng	27.1	2.2	10.3	10.3	4.1	26.8	10.3	16.8		27.1
9	9a	Donglo	34.7	2.4	11.5	16.3	4.5	34.7	23.2	11.5		34.7
9	9b	Gomihe	41.8	11.3	16.7	8.4	5.4	41.8	28.0	11.3	2.9	42.2
9	9c	Nangchenma	37.3	14.9	12.3	10.1		37.3	17.5	19.8		37.3
9	9d	Phrenglateng	33.8	2.4	13.5	17.9		33.8	15.9	17.9		33.8
10	10a	Panglem Breng	50.1		8.5	33.6	8.5	50.6	11.0	30.6	8.5	50.1
10	10b	Jatasa	25.8		1.8	10.3	13.7	25.8	3.4	10.3	12.1	25.8
10	10c	Labisa Khandronanag	86.3		52.6	33.7		86.3	25.9	56.1	3.5	85.4
10	10d	Tagaisa-Ihsezur	40.2		21.3	18.9		40.2	16.5	23.7		40.2
10	10e	Phromshing-Bompo	93		15.8	69.8	7.4	93.0	27.0	58.6	7.4	93.0
10	10f	Phrangmoleng	72.3		17.4	54.9		72.3	23.9	44.8	3.6	72.3
10	10g	Arkelamo-Moshimaju	67.4		16.2	51.2		67.4	2.7	64.7		67.4
11	11a	Gaylay-Shushulaga	49.2		21.6	27.6		49.2		49.2		49.2
11	11b	Chumagpo	31.1		9.6	21.5		31.1	4.0	26.7		30.8
11	11c	Khashiteng	37.7		10.9	13.2	13.2	37.3	22.2	13.2	2.3	37.7

Compartment	Prod. Area (ha)	Canopy closure (ha)					Condition (ha)			
		dense	closed	open	unstocked	Total	good	average	poor	Total
1 Nakarpo-Naju	78.0	3%	18%	51%	28%	100%	20%	62%	18%	100%
2 Sakshum	261.0	1%	10%	69%	20%	100%	9%	86%	5%	100%
3 Serkemla-Sanglasa	214.8	20%	54%	18%	8%	100%	25%	20%	55%	100%
4 Phakchu	191.3	20%	65%	11%	4%	100%	40%	40%	20%	100%
5 Damangjuk	257.0	8%	58%	22%	12%	100%	24%	33%	43%	100%
6 Gasejab-Jangphutse	307.6	4%	48%	46%	1%	100%	12%	75%	13%	100%
7 Dothrabilhrab-Belheng	110.4	16%	66%	17%	2%	100%	50%	43%	7%	101%
8 Gasabjuk-Rongbreng	64.3	15%	41%	36%	6%	99%	40%	56%	4%	100%
9 Phrengla-Gomihe	147.6	21%	37%	36%	7%	100%	57%	41%	2%	100%
10 Kheliphu	435.1		31%	63%	7%	100%	25%	66%	8%	100%
11 Khashiteng	118.0		36%	53%	11%	100%	22%	76%	2%	100%
Total	2185.1	8%	42%	42%	9%	100%	26%	56%	18%	100%

Age Distribution and Stand Types in Forest Management Area of: Merak

Comp No.	Sub-Compartment		Prod. Area (ha)	Age distribution					Stand type distribution			
	No.	Name		young	immature	mature	overmature	Total	plantation	natural	coopice	Total
1	1a	Nakarpo	35.6	11.7	11.7	11.7		35.2		35.6		35.6
1	1b	Naju	42.4	6.4	16.1	13.1	6.4	42.0		42.4		42.4
2	2a	Wongor jab	70.5		4.2	50.8	15.5	70.5		70.5		70.5
2	2b	Wongor jab 2	52.9		3.2	38.1	11.6	52.9		52.9		52.9
2	2c	Sakshum	60.6	3.6	17.6	32.1	7.3	60.6		60.6		60.6
2	2d	Dungmera-Chara	77	11.6	11.6	38.5	15.4	77.0		77.0		77.0
3	3a	Sangtasa	65.9	5.9	9.2	23.7	27.0	65.9		65.9		65.9
3	3b	Serkemla	79	7.9	11.1	26.1	34.0	79.0		79.0		79.0
3	3c	Serkemla 2	69.9	4.9	4.9	37.0	23.1	69.9		69.9		69.9
4	4a	Phakchu	78.5		7.9	51.0	19.6	78.5		78.5		78.5
4	4b	Marzonjab	45.5		3.2	39.6	3.2	46.0		45.5		45.5
4	4c	Marteng	67.3	17.5	7.4	31.6	10.8	67.3		67.3		67.3
5	5a	Damangjuk	88.6	4.4		31.0	53.2	88.6		88.6		88.6
5	5b	Damangjuk 2	90.3	9.0	4.5	56.0	21.7	91.2		90.3		90.3
5	5c	Tshega	78.1	3.9	3.9	46.9	23.4	78.1		78.1		78.1
6	6a	Gase-Lithejab 2	35.3	4.9		22.6	7.4	34.9		35.3		35.3
6	6b	Gasejab-Marzong	63.4		24.1	39.9		64.0		63.4		63.4
6	6c	Gasejab-Marzong	30.8		11.7	19.4		31.1		30.8		30.8
6	6d	Lepchungnang-sq	82.5	7.4	19.0	41.3	14.9	82.5		82.5		82.5
6	6e	Nimdroma-Maeju	62.1	8.1		39.1	15.5	62.7		62.1		62.1
6	6f	Melung-Jangphut	33.5			18.4	15.1	33.5		33.5		33.5
7	7a	Lethe-Sumthengj	12.6	2.1		10.5		12.6		12.6		12.6
7	7b	Gase-Lithejab	37.9	5.3		24.3	8.0	37.5		37.9		37.9
7	7c	Dothrabthrab-Bet	59.9			59.9		59.9		59.9		59.9
8	8a	Gasabjuk	3.3		3.3			3.3		3.3		3.3
8	8b	Sazur	33.9	5.1	7.8	18.3	2.7	33.9		33.9		33.9
8	8c	Rongbreng	27.1	8.4	4.1	12.5	2.2	27.1		27.1		27.1
9	9a	Donglo	34.7	4.5	4.5	25.3		34.4		34.7		34.7
9	9b	Gomthe	41.8	2.9		38.9		41.8		41.8		41.8
9	9c	Nangchenma	37.3		7.5	25.0	4.8	37.3		37.3		37.3
9	9d	Phrenglateng	33.8		2.4	31.4		33.8		33.8		33.8
10	10a	Panglem Breng	50.1	5.5	19.5	25.1		50.1		50.1		50.1
10	10b	Jatasa	25.8	1.8	8.5	15.5		25.8		25.8		25.8
10	10c	Labtsa Khandron	86.3	3.5	22.4	60.4		86.3		86.3		86.3
10	10d	Tagaisa-thsezur	40.2	2.4	7.2	30.6		40.2		40.2		40.2
10	10e	Phromshing-Bom	93	7.4	27.0	58.6		93.0		93.0		93.0
10	10f	Phrangmoteng	72.3	3.6	21.0	41.2	7.2	73.0		72.3		72.3
10	10g	Arkelamo-Moshin	67.4			5.4	62.0	67.4		67.4		67.4
11	11a	Gaytay-Shushula	49.2	9.3	39.9			49.2		49.2		49.2
11	11b	Chumagpo	31.1		23.3	7.8		31.1		31.1		31.1
11	11c	Khashiteng	37.7	24.5	6.8	6.8		38.1		37.7		37.7

Compartment	Prod. Area (ha)	Age distribution					Stand type distribution				
		young	immature	mature	overmature	Total	plantation	natural	coopice	Total	
1	Nakarpo-Naju	78.0	23%	36%	32%	8%	99%		100%		100%
2	Sakshum	261.0	6%	14%	61%	19%	100%		100%		100%
3	Serkemla-Sangtasa	214.8	9%	12%	40%	39%	100%		100%		100%
4	Phakchu	191.3	9%	10%	64%	18%	100%		100%		100%
5	Damangjuk	257.0	7%	3%	52%	38%	100%		100%		100%
6	Gasejab-Jangphutse	307.6	7%	18%	59%	17%	100%		100%		100%
7	Dothrabthrab-Betheng	110.4	7%		86%	7%	100%		100%		100%
8	Gasabjuk-Rongbreng	64.3	21%	24%	48%	8%	100%		100%		100%
9	Phrengla-Gomthe	147.6	5%	10%	82%	3%	100%		100%		100%
10	Kheliphu	435.1	6%	24%	54%	16%	100%		100%		100%
11	Khashiteng	118.0	29%	59%	12%		100%		100%		100%
Total	2185.1	9%	17%	55%	19%	100%		100%		100%	

Forest Management Area of: **Merak**

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Slope (in ha)			Erosiveness (in ha)			Soil Cover (in ha)		
			gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
1	1a Nakarpo	35.6		18.9	16.7	16.7	14.2	4.6	16.7	14.2	4.6
1	1b Naju	42.4	9.8	22.9	9.8	16.1	22.9	3.4	6.4	29.3	6.4
2	2a Wongor jab	70.5	4.2	43.0	23.3	15.5	19.7	35.3	12.0	58.5	4.2
2	2b Wongor jab 2	52.9	3.2	32.3	17.5	11.6	14.8	26.5	9.0	43.9	3.2
2	2c Sakshum	60.6		24.8	35.8	7.3	49.7	3.6	10.9	46.1	3.6
2	2d Dungmera-Charam	77	7.7	38.5	30.8	11.6	42.4	23.1	3.9	57.8	15.4
3	3a Sanglasa	65.9		60.0	5.9	5.9	60.0		5.9	50.7	9.2
3	3b Serkemla	79		71.1	7.9	7.9	71.1		7.9	60.0	11.1
3	3c Serkemla 2	69.9	32.9	28.0	9.1	23.1	41.9	4.9	18.9	41.9	9.1
4	4a Phakchu	78.5	39.3	19.6	19.6	23.6	55.0		19.6	51.0	7.9
4	4b Marzonjab	45.5	15.0	15.0	15.0	9.1	30.5	5.9	9.1	30.5	5.9
4	4c Marlung	67.3	17.5	42.4	7.4	31.6	28.3	7.4	35.7	17.5	14.1
5	5a Damangjuk	88.6	22.2	57.6	8.9	57.6	31.0			31.0	57.6
5	5b Damangjuk 2	90.3		26.2	64.1	26.2	64.1		17.2	73.1	
5	5c Tshaga	78.1	19.5	19.5	39.1	39.1	39.1		39.1	39.1	
6	6a Gase-Lithejab 2	35.3	10.2	20.1	4.9	17.7	17.7		15.2	20.1	
6	6b Gasejab-Marzong	63.4	43.7	12.0	8.2	47.6	15.9		27.9	31.7	3.8
6	6c Gasejab-Marzong 2	30.8	21.3	5.9	4.0	23.1	7.7		13.6	15.4	1.8
6	6d Lepchungnang-songr	82.5	33.8	29.7	19.0	56.1	26.4		37.1	37.1	7.4
6	6e Nimdroma-Maejung	62.1	31.1	19.3	11.8	19.3	42.8		15.5	46.6	
6	6f Melung-Jangphutse	33.5	9.0	12.1	12.1	24.5	9.0		6.0	18.4	9.0
7	7a Lethe-Sumthengjug	12.6	2.1	10.5		4.2	8.4		2.1	8.4	2.1
7	7b Gase-Lithejab	37.9	11.0	21.6	5.3	19.0	19.0		16.3	21.6	
7	7c Dothrabthrab-Betheng	59.9	22.8	37.7		37.7	22.8		33.5	26.4	
8	8a Gasabjuk	3.3			3.3		3.3			3.3	
8	8b Sazur	33.9	5.1	18.3	10.5	28.8	5.1		15.6	18.3	
8	8c Rongbreng	27.1	8.4	8.4	10.3	16.8	10.3		4.1	16.8	6.2
9	9a Donglo	34.7	2.4	23.2	9.4	32.3	2.4		25.3	6.9	2.4
9	9b Gomthe	41.8	2.9	16.7	22.2	30.5	11.3		25.1	13.8	2.9
9	9c Nangcherma	37.3	14.9	12.3	10.1	27.2	10.1		14.9	12.3	10.1
9	9d Phrenglateng	33.8	9.1	17.9	6.8	22.6	11.2		20.3	11.2	2.4
10	10a Panglem Breng	50.1	8.5	22.0	19.5	28.1	22.0		11.0	28.1	11.0
10	10b Jatasa	25.8	12.1		13.7	12.1		13.7	1.8	10.3	13.7
10	10c Labisa Khandronanag	86.3		78.5	7.8	71.6	14.7		25.9	37.1	22.4
10	10d Tagaisa-Ihsezur	40.2	2.4	33.0	4.8	4.8	35.4			30.6	9.6
10	10e Phromshing-Bompo	93	15.8	58.6	19.5	73.5	19.5		12.1	69.8	12.1
10	10f Phrangmoteng	72.3		27.5	44.8	48.4	23.9		7.2	54.9	10.1
10	10g Arkelamo-Moshimoju	67.4		27.0	40.4	27.0	40.4		2.7	37.7	27.0
11	11a Gaytay-Shushulaga	49.2	9.3	31.0	9.3	33.9	15.3				49.2
11	11b Chumagpo	31.1		9.6	21.5	21.5	9.6		1.9	7.8	21.5
11	11c Khashiteng	37.7	2.3	22.2	13.2	30.9	6.8		15.5	20.0	2.3

Compartment	Prod. Area (ha)	Slope (in ha)			Erosiveness (in ha)			Soil Cover (in ha)		
		gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
1 Nakarpo-Naju	78.0	13%	54%	34%	42%	48%	10%	30%	56%	14%
2 Sakshum	261.0	6%	53%	41%	18%	49%	34%	14%	79%	10%
3 Serkemla-Sanglasa	214.8	15%	74%	11%	17%	81%	2%	15%	71%	14%
4 Phakchu	191.3	38%	40%	22%	34%	59%	7%	34%	52%	15%
5 Damangjuk	257.0	16%	40%	44%	48%	52%		22%	56%	22%
6 Gasejab-Jangphutse	307.6	48%	32%	20%	61%	39%		37%	55%	7%
7 Dothrabthrab-Betheng	110.4	33%	63%	5%	55%	45%		47%	51%	2%
8 Gasabjuk-Rongbreng	64.3	21%	42%	37%	71%	29%		31%	60%	10%
9 Phrengla-Gomthe	147.6	20%	48%	33%	76%	24%		58%	30%	12%
10 Kheliphu	435.1	9%	57%	35%	61%	36%	3%	14%	62%	24%
11 Khashiteng	118.0	10%	53%	37%	73%	27%		15%	24%	62%
Total	2185.1	21%	50%	29%	49%	46%	6%	26%	57%	17%

Distribution of Management Options for Forest Management Area of: **Merak**

Com p No.	Sub-Compartment		Prod. Area (ha)	Management Option (in ha)					
	No.	Name		No activity	Improvement	Timber	Firewood	Silvopast	Shokshing
1	1a	Nakarpo	35.6	50.7	0.0	0.0	0.0	0.0	0.0
1	1b	Naju	42.4	0.0	29.4	11.8	1.2	0.0	0.0
2	2a	Wongor jab	70.5	0.0	0.0	62.7	0.0	0.0	0.0
2	2b	Wongor jab 2	52.9	0.0	0.0	47.0	0.0	0.0	0.0
2	2c	Sakshum	60.6	0.0	0.0	60.5	0.0	0.0	0.0
2	2d	Dungmera-Charam	77	0.0	0.0	69.2	0.0	0.0	0.0
3	3a	Sangtasa	65.9	0.0	41.9	24.0	0.0	0.0	0.0
3	3b	Serkemla	79	0.0	48.9	30.1	0.0	0.0	0.0
3	3c	Serkemla 2	69.9	0.0	4.7	28.0	37.3	0.0	0.0
4	4a	Phakchu	78.5	0.0	43.2	31.4	0.0	0.0	0.0
4	4b	Marzonjab	45.5	0.0	0.0	30.3	9.1	0.0	0.0
4	4c	Marteng	67.3	0.0	10.6	35.4	17.7	0.0	0.0
5	5a	Damangjuk	88.6	0.0	62.0	0.0	26.6	0.0	0.0
5	5b	Damangjuk 2	90.3	0.0	47.3	0.0	38.7	0.0	0.0
5	5c	Tshega	78.1	0.0	62.5	0.0	15.6	0.0	0.0
6	6a	Gase-Lithejab 2	35.3	0.0	0.0	12.7	15.0	0.0	0.0
6	6b	Gasejab-Marzong	63.4	0.0	0.0	14.0	9.8	0.0	0.0
6	6c	Gasejab-Marzong 2	30.8	0.0	0.0	10.0	1.6	0.0	0.0
6	6d	Lepchungnang-songr	82.5	0.0	0.0	16.5	6.0	0.0	0.0
6	6e	Nimdroma-Maejung	62.1	0.0	0.0	22.3	32.0	0.0	0.0
6	6f	Melung-Jangphutse	33.5	0.0	0.0	4.0	5.1	0.0	0.0
7	7a	Lethe-Sumthengjug	12.6	0.0	0.0	4.0	6.5	0.0	0.0
7	7b	Gase-Lithejab	37.9	0.0	0.0	16.0	13.8	0.0	0.0
7	7c	Dothrabthrab-Betheng	59.9	0.0	0.0	35.0	24.9	0.0	0.0
8	8a	Gasabjuk	3.3	0.0	3.3	0.0	0.0	0.0	0.0
8	8b	Sazur	33.9	0.0	0.0	8.0	5.0	0.0	0.0
8	8c	Rongbrenng	27.1	0.0	0.0	18.7	0.0	0.0	0.0
9	9a	Donglo	34.7	0.0	0.0	27.8	0.0	0.0	0.0
9	9b	Gomthe	41.8	0.0	0.0	41.8	0.0	0.0	0.0
9	9c	Nangchenma	37.3	0.0	0.0	34.8	0.0	0.0	0.0
9	9d	Phrenglateng	33.8	0.0	2.3	12.4	12.4	0.0	0.0
10	10a	Panglem Breng	50.1	5.6	0.0	0.0	0.0	0.0	0.0
10	10b	Jatasa	25.8	0.0	25.8	0.0	0.0	0.0	0.0
10	10c	Labtsa Khandronanag	86.3	0.0	0.0	41.3	0.0	0.0	0.0
10	10d	Tagaisa-thsezur	40.2	0.0	0.0	0.0	10.2	0.0	0.0
10	10e	Phromshing-Bompo	93	0.0	0.0	46.5	0.0	0.0	0.0
10	10f	Phrrangmoteng	72.3	0.0	0.0	24.1	0.0	0.0	0.0
10	10g	Arkelamo-Moshimoju	67.4	0.0	0.0	51.2	0.0	0.0	0.0
11	11a	Gaytay-Shushulaga	49.2	0.0	58.4	0.0	6.2	0.0	0.0
11	11b	Chumagpo	31.1	0.0	33.0	0.0	0.0	0.0	0.0
11	11c	Khashiteng	37.7	0.0	33.2	0.0	3.4	0.0	0.0

Compartment	Prod. Area (ha)	Management Option (in ha)					
		No activity	Improvement	Timber	Firewood	Silvopast	Shokshing
1 Nakarpo-Naju	78.0	50.7	29.4	11.8	1.2	0.0	0.0
2 Sakshum	261.0	0.0	0.0	239.4	0.0	0.0	0.0
3 Serkemla-Sangtasa	214.8	0.0	95.5	82.1	37.3	0.0	0.0
4 Phakchu	191.3	0.0	53.8	97.1	26.8	0.0	0.0
5 Damangjuk	257.0	0.0	171.8	0.0	80.9	0.0	0.0
6 Gasejab-Jangphutse	307.6	0.0	0.0	79.5	69.5	0.0	0.0
7 Dothrabthrab-Betheng	110.4	0.0	0.0	55.0	45.2	0.0	0.0
8 Gasabjuk-Rongbrenng	64.3	0.0	3.3	26.7	5.0	0.0	0.0
9 Phrengla-Gomthe	147.6	0.0	2.3	116.8	12.4	0.0	0.0
10 Kheliphu	435.1	5.6	25.8	163.1	10.2	0.0	0.0
11 Khashiteng	118.0	0.0	124.6	0.0	9.6	0.0	0.0
Total	2185.1	56.3	506.5	871.5	298.1	0.0	0.0

Production Potential of Forest Management Area: Merak

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Volume (m3/ha)	harv. Volume (m3/ha)	Extract Rate	Timber (Total Volume m3)				Firewood (Total Volume m3)			
						Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1	1a Nakapo	35.6	155.0	0.0	0.0%	0	0	0	0	0	0	0	0
1	1b Naju	42.4	243.8	473.0	46.2%	385	1211	966	480	1731	0	0	0
2	2a Wongorjab	70.5	344.5	17167.0	70.7%	6650	1034	387	52	7094	904	447	599
2	2b Wongorjab 2	52.9	344.5	12873.0	70.6%	4987	775	290	39	5320	678	335	449
2	2c Sakshum	60.6	456.8	19582.0	70.7%	8379	1852	470	95	7706	323	177	580
2	2d Dungmera-Charam	77.0	264.6	11933.0	58.6%	8343	1577	380	51	1259	193	90	40
3	3a Sanglasa	65.9	309.5	18432.0	90.4%	719	2139	584	561	11309	1495	810	815
3	3b Serkemla	79.0	382.0	27814.0	92.2%	2271	3116	1291	704	14252	2834	1725	1621
3	3c Serkemla 2	69.9	748.6	52350.0	100.0%	14061	1729	667	499	30697	1934	1480	1283
4	4a Phakchu	78.5	588.8	45145.0	97.7%	154	1878	1844	1208	32294	2898	1150	3719
4	4b Marzonjab	45.5	524.0	23822.0	99.9%	0	837	1282	568	14324	2097	2405	2309
4	4c Marteng	67.3	469.8	30941.0	97.9%	420	1899	1040	568	22279	2678	1272	785
5	5a Damangjuk	88.6	467.3	41381.0	99.9%	0	81	292	306	36296	330	1739	2337
5	5b Damangjuk 2	90.3	501.2	44354.0	98.4%	0	758	875	1150	34713	3304	1848	1906
5	5c Tshaga	78.1	541.3	41254.0	97.6%	0	285	826	778	32543	2305	1676	2841
6	6a Gase-Lithejab 2	35.3	314.0	8880.0	80.1%	4892	461	332	371	2045	72	286	421
6	6b Gasejab-Marzong	63.4	186.4	9615.0	81.4%	3176	1091	1742	955	716	1027	729	179
6	6c Gasejab-Marzong 2	30.8	185.4	4631.0	81.1%	1502	530	847	464	348	499	354	87
6	6d Lepchungnang-songr	82.5	274.8	18319.0	80.8%	5910	1301	877	1003	8181	275	337	435
6	6e Nimdroma-Macjung	62.1	740.0	39934.0	86.9%	6872	711	491	882	28909	208	347	1514
6	6f Melung-Jangphulse	33.5	124.7	3897.0	93.3%	481	565	251	308	1089	684	193	326
7	7a Lethe-Sumthengjug	12.6	214.3	1173.0	43.4%	490	365	0	28	0	125	117	48
7	7b Gase-Lithejab	37.9	314.0	9549.0	80.2%	5260	495	357	399	2199	78	308	453
7	7c Dothrabhrab-Betheng	59.9	215.7	10002.0	77.4%	5369	2659	432	401	229	0	366	546
8	8a Gasabjuk	3.3	232.6	443.0	57.7%	263	0	0	0	71	109	0	0
8	8b Sazur	33.9	669.1	21360.0	95.6%	7064	239	70	47	13133	201	342	264
8	8c Rongbreng	27.1	956.7	24714.0	95.3%	13125	72	29	0	10884	219	297	88
9	9a Donglo	34.7	461.7	15480.0	96.6%	12038	920	96	24	1880	36	67	419
9	9b Gomthe	41.8	433.7	10392.0	57.3%	8516	1347	179	29	56	76	0	189
9	9c Nangchenma	37.3	825.3	25192.0	81.8%	23005	42	0	0	1924	153	48	20
9	9d Phrenglateng	33.8	400.0	12203.0	90.3%	10205	716	371	90	86	229	297	209
10	10a Panglem Breng	50.1	233.6	8730.0	74.6%	8679	0	0	0	0	51	0	0
10	10b Jalasa	25.8	243.8	3514.0	55.9%	2173	27	0	0	1282	32	0	0
10	10c Labisa Khandronanag	86.3	75.3	5947.0	91.5%	0	2228	1464	627	125	1054	389	60
10	10d Tagasa-thsezur	40.2	71.3	2751.0	96.0%	0	306	222	23	862	958	286	94
10	10e Phromshing-Bompo	93.0	531.2	48645.0	98.5%	40900	0	0	0	7610	135	0	0
10	10f Phrangnoteng	72.3	513.0	34144.0	92.1%	33510	0	0	0	521	113	0	0
10	10g Arkelamo-Moshimaju	67.4	96.4	6132.0	94.4%	414	427	129	52	2040	2379	497	194
11	11a Gaylay-Shushulaga	49.2	107.7	5245.0	99.0%	342	459	136	49	897	1722	1161	479
11	11b Chumagpo	31.1	133.8	3605.0	86.6%	273	329	43	0	1784	1076	100	0
11	11c Khashiteng	37.7	129.4	3778.0	77.4%	2063	341	212	35	662	367	98	0

Total per Compartment													
Compartment	Prod. Area (ha)	Volume (m3/ha)	harv. Volume (m3/ha)	Extract Rate	Timber (Total Volume m3)				Firewood (Total Volume m3)				
					Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm	
1 Nakapo-Naju	78.0	203.3	4773	30%	385	1211	966	480	1731	0	0	0	0
2 Sakshum	261.0	347.0	61555	68%	28359	5238	1527	237	21379	2098	1049	1668	
3 Serkemla-Sanglasa	214.8	479.1	98596	96%	17051	6984	2542	1764	56258	6263	4015	3719	
4 Phakchu	191.3	531.5	99908	98%	574	4614	4166	2344	68897	7673	4827	6813	
5 Damangjuk	257.0	501.7	127189	99%	0	1124	1993	2234	103552	5939	5263	7084	
6 Gasejab-Jangphulse	307.6	329.7	85276	84%	22833	4659	4540	3983	41288	2765	2246	2962	
7 Dothrabhrab-Betheng	110.4	249.3	20724	75%	11119	3519	789	828	2428	203	791	1047	
8 Gasabjuk-Rongbreng	64.3	762.6	48517	95%	20452	311	99	47	24088	529	639	352	
9 Phrengla-Gomthe	147.6	531.5	63267	81%	53764	3025	646	143	3946	494	412	837	
10 Kheiphu	435.1	276.6	109863	91%	85676	2988	1815	702	12440	4722	1172	348	
11 Khashiteng	118.0	121.5	12628	88%	2678	1129	391	84	3343	3165	1359	479	
Total	2185.1	4333.8	730296.0	88%	242891	34802	19474	12846	339350	33851	21773	25309	

Production Potential of Forest Management Area: Merak

Comp No.	Sub-Compartment No.	Name	Prod. Area (ha)	BA (m ² /ha)	BAextr. (m ² /ha)	Extract. Rate	Timber (N total)				Firewood (N total)			
							Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1	1a	Nakarpo	35.6	6.7										
1	1b	Naju	42.4	23.4	10.7	45.8%	149	1141	2390	4058	169			
2	2a	Wongor jab	70.5	16.3	15.9	97.5%	706	819	958	444	833	1078	1597	8871
2	2b	Wongor jab 2	52.9	16.3	15.9	97.5%	529	614	719	333	625	809	1198	6653
2	2c	Sakshum	60.6	19.8	21.6	108.9%	1211	1694	1161	807	794	519	726	8469
2	2d	Dungmra-Charam	77.0	12.5	9.4	75.2%	946	1444	941	436	206	177	314	436
3	3a	Sangtasa	65.9	18.5	33.2	179.5%	250	2084	1465	4746	1456	1511	2807	44527
3	3b	Serkemia	79.0	26.1	32.9	126.0%	478	2901	3218	5960	2029	2728	5057	23412
3	3c	Serkemia 2	69.9	28.3	47.6	168.3%	1809	1555	1710	4221	3679	2040	5699	18468
4	4a	Phakchu	78.5	44.9	53.3	118.7%	66	1864	4638	10218	5292	2524	3838	55086
4	4b	Marzonjab	45.5	45.9	8.8	19.1%		870	3211	4802	50	43	185	739
4	4c	Marlung	67.3	24.7	33.9	137.3%	157	1872	2586	4808	2788	2480	4039	10817
5	5a	Damagjuk	88.6	17.4	27.8	159.7%		92	722	3007	4245	295	5592	23551
5	5b	Damangjuk 2	90.3	23.5	35.1	149.2%		858	2277	10215	4338	2976	5779	24808
5	5c	Tshega	78.1	26.4	38.4	145.3%		325	2070	7075	4049	2344	5413	34492
6	6a	Gase-Lithejab 2	35.3	18.0	19.5	108.2%	754	400	822	3138	207	84	1130	5991
6	6b	Gasejab-Marzong	63.4	20.3	19.2	94.8%	960	1171	4362	8079	177	828	2585	2693
6	6c	Gasejab-Marzong 2	30.8	20.1	19.2	95.3%	459	569	2120	3925	86	403	1256	1308
6	6d	Lepchungrang-songr	82.5	13.2	16.0	121.1%	814	1296	2292	8487	1006	219	1069	6366
6	6e	Nimdroma-Maejung	62.1	29.8	39.3	131.9%	1323	584	1265	7466	3271	146	1107	18884
6	6f	Melung-Jangphutse	33.5	15.5	16.4	105.5%	179	533	620	2755	374	584	620	4821
7	7a	Lethe-Sumthengjug	12.6	13.7	10.9	79.6%	78	334		238		219	429	715
7	7b	Gase-Lithejab	37.9	18.0	19.5	108.4%	811	430	883	3374	223	90	1215	6442
7	7c	Dotrabthrab-Betheng	59.9	22.6	20.3	90.0%	1491	2344	1068	3391	53		1526	8054
8	8a	Gasabjuk	3.3	26.0	8.8	33.7%	33				15	83		
8	8b	Sazur	33.9	18.3	30.3	165.6%	815	207	213	591	1373	271	1063	2953
8	8c	Rongbreng	27.1	19.7	39.4	200.2%	1350	52	85		1117	303	1018	1179
9	9a	Donglo	34.7	14.7	23.4	158.9%	1280	850	283	262	166	29	283	6289
9	9b	Gornthe	41.8	14.8	16.4	111.0%	1049	1417	568	315	17	116		2838
9	9c	Nangchenma	37.3	14.4	24.4	169.4%	2057	31			188	217	202	281
9	9d	Phrenglateng	33.8	17.3	20.7	119.6%	1107	630	919	765	24	254	1010	2551
10	10a	Panglem Breng	50.1	8.2	7.6	92.4%	975					35		
10	10b	Jalasa	25.8	5.5	5.3	96.9%	227	22			116	22		
10	10c	Labtsa Khandronanag	86.3	12.3	12.1	98.7%		2907	5353	8921	63	1236	1376	850
10	10d	Tagaisa-thezur	40.2	9.9	10.4	105.1%		384	771	268	303	1076	1061	1339
10	10e	Phromshing-Borpo	93.0	6.2	21.0	338.4%	4353				675	129		
10	10f	Phrangmoteng	72.3	13.0	20.6	158.1%	3680				135	143		
10	10g	Arkelamo-Moshimoju	67.4	12.1	13.3	110.0%	148	506	439	610	761	2607	1648	2441
11	11a	Gaytay-Shushulaga	49.2	14.4	15.5	107.5%	148	513	502	697	282	1732	3511	5921
11	11b	Chumagpo	31.1	14.5	13.8	94.9%	104	316	158		521	989	316	
11	11c	Khashiteng	37.7	12.1	9.9	82.0%	327	333	722	502	233	434	361	

Compartment	Prod. Area (ha)	BA (m ² /ha)	BAextr. (m ² /ha)	Extract. Rate	Timber (N total)				Firewood (N total)					
					Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm		
1	Nakarpo-Naju	78.0	15.8	5.8	37%	149	1141	2390	4058	169				
2	Sakshum	261.0	16.0	15.3	96%	3392	4571	3779	2020	2458	2583	3835	24429	
3	Serkemia-Sangtasa	214.8	24.5	37.8	154%	2537	6540	6393	14927	7164	6279	13563	86407	
4	Phakchu	191.3	38.0	35.9	94%	223	4606	10445	19828	8130	5047	8062	66642	
5	Damangjuk	257.0	22.3	33.6	151%		1275	5069	20297	12632	5615	16784	82851	
6	Gasejab-Jangphutse	307.6	19.5	22.1	113%	4489	4553	11481	33850	5121	2264	7767	40063	
7	Dotrabthrab-Betheng	110.4	20.0	19.0	95%	2380	3108	1951	7003	276	309	3170	15211	
8	Gasabjuk-Rongbreng	64.3	19.3	33.1	171%	2198	259	298	591	2505	657	2081	4132	
9	Phrengja-Gornthe	147.6	15.2	21.0	138%	5493	2928	1770	1342	395	616	1495	11959	
10	Kheliphu	435.1	10.0	14.5	145%	9383	3819	6563	9799	2053	5248	4085	4630	
11	Khashiteng	118.0	13.7	13.2	97%	579	1162	1382	1199	1036	3155	4188	5921	
Total		2185.1	214.3	251.3	117%	30823	33962	51521	114914	41939	31773	65030	342245	

Silvicultural Measures for Forest Management Area: Merak

Comp No.	Sub-Compartment No. Name	Production Area (ha)	Sivicultural Measures (in ha)			Sivicultural Measures (in % of area)		
			Planting	Thinning	Felling	Planting	Thinning	Felling
1	1a Nakarpo	35.6						
1	1b Naju	42.4	3.4	26.3	12.7	8	62	30
2	2a Wongor jab	70.5			62.7			89
2	2b Wongor jab 2	52.9			47.1			89
2	2c Sakshum	60.6		35.8	24.8		59	41
2	2d Dungnera-Charam	77.0		27.0	42.4		35	55
3	3a Sangtasa	65.9	5.9	36.2	23.7	9	55	36
3	3b Serkemla	79.0	7.9	41.1	30.0	10	52	38
3	3c Serkemla 2	69.9	4.9	28.0	37.0	7	40	53
4	4a Phakchu	78.5		43.2	31.4		55	40
4	4b Marzonjab	45.5		30.5	9.1		67	20
4	4c Marteng	67.3	10.8	35.7	17.5	16	53	26
5	5a Damangjuk	88.6	62.0		26.6	70		30
5	5b Damangjuk 2	90.3		47.0	38.8		52	43
5	5c Tshaga	78.1	7.8	54.7	15.6	10	70	20
6	6a Gase-Lithejab 2	35.3		7.4	27.9		21	79
6	6b Gasejab-Marzong	63.4		24.1	24.1		38	38
6	6c Gasejab-Marzong 2	30.8		11.7	11.7		38	38
6	6d Lepchungnang-songr	82.5		22.3	22.3		27	27
6	6e Nimdroma-Maejung	62.1		8.1	54.6		13	88
6	6f Melung-Jangphutse	33.5		18.4	9.0		55	27
7	7a Lethe-Sumthengjug	12.6			10.5			83
7	7b Gase-Lithejab	37.9		8.0	29.9		21	79
7	7c Dothrabthrab-Betheng	59.9			59.9			100
8	8a Gasabjuk	3.3	3.3			100		
8	8b Sazur	33.9		12.9	12.9		38	38
8	8c Rongbreng	27.1		8.4	18.7		31	69
9	9a Donglo	34.7		0.8	8.8		2	26
9	9b Gomthe	41.8		8.4	33.4		20	80
9	9c Nangchenma	37.3		7.5	27.2		20	73
9	9d Phrenglateng	33.8	2.4		24.7	7		73
10	10a Panglem Breng	50.1	16.5	25.1	5.5	33	50	11
10	10b Jatasa	25.8	15.5	10.3		60	40	
10	10c Labtsa Khandronanag	86.3	14.7	30.2	41.4	17	35	48
10	10d Tagaisa-thsezur	40.2	18.9		21.3	47		53
10	10e Phromshing-Bompo	93.0	12.1	35.3	46.5	13	38	50
10	10f Phrangmoteng	72.3	13.7	34.7	23.9	19	48	33
10	10g Arkelamo-Moshimoju	67.4		13.5	51.2		20	76
11	11a Gaytay-Shushulaga	49.2	36.9	21.6		75	44	
11	11b Chumagpo	31.1	9.6	23.3	7.8	31	75	25
11	11c Khashiteng	37.7	13.2	20.0	9.0	35	53	24

Compartment	Production Area (ha)	Sivicultural Measures (in ha)			Sivicultural Measures (in % of area)			
		Planting	Thinning	Felling	Planting	Thinning	Felling	
1	Nakarpo-Naju	78	3.4	26.3	12.7	34	16	
2	Sakshum	261		62.7	177.0		68	
3	Serkemla-Sangtasa	214.8	18.7	105.3	90.8	49	42	
4	Phakchu	191.3	10.8	109.3	58.0	57	30	
5	Damangjuk	257	69.8	101.6	81.0	40	32	
6	Gasejab-Jangphutse	307.6		92.0	149.7		49	
7	Dothrabthrab-Betheng	110.4		8.0	100.3		91	
8	Gasabjuk-Rongbreng	64.3	3.3	21.3	31.6	33	49	
9	Phrengla-Gomthe	147.6	2.4	16.6	94.2	11	64	
10	Kheliphu	435.1	91.4	149.1	189.8	34	44	
11	Khashiteng	118	59.7	65.0	16.8	55	14	
Total	2185.1	259.5	757.1	1001.9		12	35	46

NWFP Occurrence in Forest Management Area of: Merak

Comp No.	Sub-Compartment		Prod. Area (ha)	Firewood				Bamboo				Cane				Daphne			
	No.	Name		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse	
				(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	1a	Nakarpo	35.6			9.6	27												
1	1b	Naju	42.4	3.4	8	26.3	62												
2	2a	Wongor jab	70.5	12.0	17	47.2	67												
2	2b	Wongor jab 2	52.9	9.0	17	35.4	67												
2	2c	Sakshum	60.6	7.3	12	39.4	65												
2	2d	Dungmera-Charam	77	19.3	25	46.2	60												
3	3a	Sangtasa	65.9	44.8	68	21.1	32												
3	3b	Serkemla	79	52.9	67	26.1	33												
3	3c	Serkemla 2	69.9	18.9	27	46.8	67												
4	4a	Phakchu	78.5	51.0	65	19.6	25												
4	4b	Marzonjab	45.5	42.3	93	12.3	27												
4	4c	Marteng	67.3	42.4	63	17.5	26												
5	5a	Damangjuk	88.6	62.0	70	26.6	30												
5	5b	Damangjuk 2	90.3	60.5	67	26.2	29												
5	5c	Tshega	78.1	54.7	70	23.4	30												
6	6a	Gase-Lithejab 2	35.3	7.4	21	25.1	71	2.5	7	2.5	7								
6	6b	Gasejab-Marzong	63.4	15.9	25	35.5	56												
6	6c	Gasejab-Marzong 2	30.8	7.7	25	17.2	56												
6	6d	Lepchungnang-song	82.5	4.1	5	63.5	77												
6	6e	Nimdroma-Maejung	62.1	15.5	25	46.6	75												
6	6f	Melung-Jangphutse	33.5	27.5	82	6.0	18												
7	7a	Lethe-Sumthengjug	12.6			8.4	67	4.2	33	2.1	17								
7	7b	Gase-Lithejab	37.9	8.0	21	26.9	71	2.7	7	2.7	7								
7	7c	Dothrabthrab-Bethe	59.9			48.5	81	3.6	6										
8	8a	Gasabjuk	3.3			3.3	100	3.3	100										
8	8b	Sazur	33.9	5.1	15	26.1	77			10.5	31								
8	8c	Rongbreng	27.1	4.1	15	20.9	77	2.2	8	2.2	8		2.2	8			4.1	15	
9	9a	Donglo	34.7	11.5	33	18.4	53	4.5	13	20.8	60				4.5	13	13.9	40	
9	9b	Gomthe	41.8	8.4	20	28.0	67	25.1	60	8.4	20								
9	9c	Nangchenma	37.3	10.1	27	12.3	33	12.3	33	7.5	20								
9	9d	Phrenglateng	33.8	13.5	40	20.3	60	11.2	33	13.5	40						4.4	13	
10	10a	Panglem Breng	50.1	5.5	11	33.6	67	30.6	61	14.0	28	3.0	6	5.5	11		11.0	22	
10	10b	Jatasa	25.8			18.8	73	12.1	47	7.0	27						10.3	40	
10	10c	Labisa Khandronan	86.3	22.4	26	63.9	74	11.2	13	52.6	61						60.4	70	
10	10d	Tagaisa-thsezur	40.2	2.4	6	37.8	94	9.6	24	28.5	71						35.4	88	
10	10e	Phromshing-Bompo	93	35.3	38	58.6	63	30.7	33	23.3	25				27.0	29	27.0	29	
10	10f	Phrrangmoteng	72.3	27.5	38	37.6	52			13.7	19				17.4	24	37.6	52	
10	10g	Arkelamo-Moshimo	67.4	24.3	36	40.4	60			62.0	92						24.3	36	
11	11a	Gaytay-Shushulaga	49.2			49.2	100												
11	11b	Chumagpo	31.1	5.9	19	25.2	81			17.4	56								
11	11c	Khashiteng	37.7	9.0	24	26.8	71			6.8	18								

Compartment	Prod. Area (ha)	Firewood				Bamboo				Cane				Daphne				
		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
1	Nakarpo-Naju	78.0	3.4	4	35.9	46												
2	Sakshum	261.0	47.5	18	168.3	64												
3	Serkemla-Sangtasa	214.8	116.6	54	94.0	44												
4	Phakchu	191.3	135.7	71	49.4	26												
5	Damangjuk	257.0	177.2	69	76.2	30												
6	Gasejab-Jangphutse	307.6	78.1	25	193.9	63	2.5	1	2.5	1								
7	Dothrabthrab-Betheng	110.4	8.0	7	83.9	76	10.4	9	4.8	4								
8	Gasabjuk-Rongbreng	64.3	9.2	14	50.3	78	5.5	9	12.7	20		2.2	3				4.1	6
9	Phrengla-Gomthe	147.6	43.4	29	79.0	54	53.1	36	50.2	34				4.5	3	18.3	12	
10	Kheliphu	435.1	117.4	27	290.7	67	94.2	22	201.2	46	3.0	1	5.5	1	44.3	10	206.0	47
11	Khashiteng	118.0	15.0	13	101.2	86			24.2	21								
Total	2185.1	751.4	34	1222.7	56	165.6	8	295.5	14	3.0	0	7.7	0	48.8	2	228.3	10	

Current Side Uses within Forest Management Area: Merak

Comp No.	Sub-Compartment		Prod. Area (ha)	Grazing				Sokshing				Lopping			
	No.	Name		Intensive		Extensive		Intensive		Extensive		Intensive		Extensive	
			(ha)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	1a	Nakarpo	35.6	16.7	47	14.2	40								
1	1b	Naju	42.4	9.8	23	19.5	46								
2	2a	Wongor jab	70.5	27.5	39	39.5	56								
2	2b	Wongor jab 2	52.9	20.6	39	29.6	56								
2	2c	Sakshum	60.6	17.6	29	35.8	59								
2	2d	Dungmera-Charam	77.0	34.7	45	38.5	50								
3	3a	Sanglasi	65.9			60.0	91								
3	3b	Serkemla	79.0			71.1	90								
3	3c	Serkemla 2	69.9			69.9	100								
4	4a	Phakchu	78.5	3.9	5	51.0	65								
4	4b	Marzonjab	45.5			39.6	87								
4	4c	Marteng	67.3	10.8	16	39.0	58								
5	5a	Damangjuk	88.6	35.4	40	53.2	60								
5	5b	Damangjuk 2	90.3	4.3	5	81.3	90								
5	5c	Tshega	78.1	3.9	5	50.8	65								
6	6a	Gase-Lithejab 2	35.3	7.4	21	12.7	36								
6	6b	Gasejab-Marzong	63.4	12.0	19	31.7	50				4.0	6			
6	6c	Gasejab-Marzong 2	30.8	5.9	19	15.4	50				1.9	6			
6	6d	Lepchungnang-songr	82.5	11.6	14	37.1	45				14.9	18	3.7	5	
6	6e	Nimdroma-Maejung	62.1	15.5	25	42.8	69				11.8	19	3.9	6	
6	6f	Melung-Jangphutse	33.5	15.1	45	18.4	55				3.0	9			
7	7a	Lethe-Sumthengjug	12.6	6.3	50	4.2	33				2.1	17			
7	7b	Gase-Lithejab	37.9	8.0	21	13.6	36								
7	7c	Dothrabthrab-Betheng	59.9	7.8	13	22.8	38								
8	8a	Gasabjuk	3.3	3.3	100										
8	8b	Sazur	33.9	2.6	8	18.3	54				2.6	8	15.6	46	
8	8c	Rongbreng	27.1	4.1	15	23.0	85								
9	9a	Donglo	34.7			32.3	93						23.2	67	
9	9b	Gomthe	41.8	2.8	7	36.4	87				2.8	7	2.8	7	
9	9c	Nangchenma	37.3	12.3	33	17.5	47								
9	9d	Phrenglateng	33.8	20.3	60	15.9	47						20.3	60	
10	10a	Panglem Breng	50.1	41.6	83	2.8	6				16.5	33	16.5	33	
10	10b	Jalasa	25.8	17.3	67	3.4	13				10.3	40	3.4	13	
10	10c	Labtsa Khandronanag	86.3			86.3	100								
10	10d	Tagaisa-Ithezur	40.2			40.2	100								
10	10e	Phromshing-Bompo	93.0	89.3	96						58.6	63	30.7	33	
10	10f	Phrrangmoteng	72.3	65.1	90	6.9	10				48.4	67	13.7	19	
10	10g	Arkelamo-Moshimoju	67.4			67.4	100								
11	11a	Gaylay-Shushulaga	49.2			49.2	100								
11	11b	Chumagpo	31.1	2.0	6	29.2	94						2.0	6	
11	11c	Khashiteng	37.7	20.0	53	17.7	47								

Compartment	Prod. Area (ha)	Grazing				Sokshing				Lopping			
		Intensive		Extensive		Intensive		Extensive		Intensive		Extensive	
	(ha)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	Nakarpo-Naju	78.0	26.5	34	33.7	43							
2	Sakshum	261.0	100.4	38	143.4	55							
3	Serkemla-Sanglasi	214.8			201.0	94							
4	Phakchu	191.3	14.7	8	129.6	68							
5	Damangjuk	257.0	43.7	17	185.2	72							
6	Gasejab-Jangphutse	307.6	67.5	22	158.2	51				35.6	12	7.6	2
7	Dothrabthrab-Betheng	110.4	22.0	20	40.6	37				2.1	2		
8	Gasabjuk-Rongbreng	64.3	10.0	16	41.3	64				2.6	4	15.6	24
9	Phrengla-Gomthe	147.6	35.4	24	102.1	69				2.8	2	46.3	31
10	Kheliphu	435.1	213.2	49	206.9	48				133.9	31	64.3	15
11	Khashiteng	118.0	21.9	19	96.2	81						2.0	2
Total	2185.1	555.2	25	1338.2	61					177.1	8	135.8	6

Calculation of AAC:

1. The average rotation period is calculated by multiplication of the proportion forest type * rotation period of forest type
2. The sustainable AAC is determined by dividing the total standing stock by the average rotation period
3. The silvicultural AAC is determined by dividing the production period by the planning period of 10 years
4. The AAC is fixed at the sustainable AAC or silvicultural AAC, whichever is lower!

Unit	Forest Type Distribution								
	Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total
Proportion	3%	66%	0%	7%	0%	0%	22%	2%	100%
Rotation period	130	140	130	120	90	90	130	120	136

AACsust. = standing volume/rotation period	6121 m ³
	2.8 m ³ /ha
AACsilv. = prod. Potential/10 years	73030 m ³
	33 m ³ /ha
AACfixed	6121 m ³
	2.8 m ³ /ha

Prod. Potential/AAC =	119 years
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Annexure 13: Compartment Register for Merak FMA

Sub-Compartment Record															
Geog	Merak		Comp.	1 Nakarpo-Naju		Sub-Comp.	Nakarpo		No.	1a					
Areas in ha															
Non Forest Area	2.9	Protection	0.3	In-operable	11.9	Production	35.6								
Forest Composition and Description															
Overall immature even aged fir forest with good regeneration of fir and rhododendron.						Stand data									
						Bas. Area (m2/ha)		6.7							
						Volume (m3/ha)		155.0							
		Volume conifer %		99%											
<p style="text-align: center;">Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S			
						Hemlock		Plantation		Type	%	%			
						Fir	33	Natural	100	Firewood		27			
						Spruce		Coppice		Bamboo					
						Mixed Conifer	67	Canopy	%	Cane					
						Blue Pine		Dense	7	Daphne					
						Chir Pine		Closed	13						
						Hardwood		Open	47						
						Mixed H/C		Unstocked	33	Forest Use	I	E			
						Age Class	%	Condition	%	Type	%	%			
						Young	33	Good	7	Grazing	47	40			
						Immature	33	Average	80	Shokshing					
						Mature	33	Poor	13	Lopping					
						Overmature		Site Characteristics							
						Slope	%	Erosiveness	%	Soil Cover	%	%			
Gentle		Stable	47	High	47										
Moderate	53	Moderate	40	Moderate	40										
Steep	47	Unstable	13	Low	13										
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%		
Chirpine															
Bluepine															
Hemlock															
Spruce															
Fir	825	755	23	11	6	2	2	0		0	11	54	25		
Other Conifers	424	589	136	19								155	71		
Oak															
Acer															
Betula															
Rhododendron	1721	1203		3								3	1		
Other Broadleaves			8									8	3		
Total	2971	2546	166	33	6	2	2	0		0	11	220	100		
Future Management & Monitoring of Activities															
Manag. Option	No activities	<input checked="" type="checkbox"/>	Should retain as it is.												
	Improvement	<input type="checkbox"/>													
	Timber Use	<input type="checkbox"/>													
	Firewood Use	<input type="checkbox"/>													
	Silvopasture	<input type="checkbox"/>													
	Sokshing	<input type="checkbox"/>													
Production Potential (N, Volume)				No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027		
>50	Drashing	117	3	66	1098										
	Firewood	205	6		2065										
30-49	Cham	30	1	12	45										
	Firewood														
20-29	Tsim			8											
	Firewood	97	3		23										
10-19	Poles, etc.														
	Firewood														
Silvicultural Measures				Area in ha implemented per year										Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting															
Thinning															
Felling															
Assessment carried out by			SWS										Year:	2019	

Sub-Compartment Record																
Geog	Merak	Comp.	1 Nakarpo-Naju	Sub-Comp.	Naju	No.	1b									
Areas in ha																
Non Forest Area	9.1	Protection	0.8	In-operable	39.1	Production	42.4									
Forest Composition and Description																
Dominant fir forest with uneven aged and matured to immature stand. Overall condition was good.						Stand data										
						Bas. Area (m2/ha)	23.4									
						Volume (m3/ha)	243.8									
						Volume conifer %	100%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	77	Natural	100	Firewood	8	62				
						Spruce		Coppice		Bamboo						
						Mixed Conifer	23	Canopy	%	Cane						
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed	23							
						Hardwood		Open	54							
						Mixed H/C		Unstocked	23	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	15	Good	31	Grazing	23	46				
						Immature	38	Average	46	Shokshing						
						Mature	31	Poor	23	Lopping						
						Overmature	15	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover		%				
Gentle	23	Stable	38	High	15											
Moderate	54	Moderate	54	Moderate	69											
Steep	23	Unstable	8	Low	15											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	735	544	392	116	29	10	5	2	0	1	7	561	76			
Other Conifers	517	571	165	9		1				0		176	24			
Oak																
Acer																
Betula																
Rhododendron	1088	1360														
Other Broadleaves																
Total	2340	2476	557	125	29	11	5	2	0	1	7	737	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Timber and poles harvesting recommended on thinning and felling basis. Plantation in some pockets of the area also recommended.													
	Improvement	√														
	Timber Use	√														
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	149	4	51	385											
	Firewood	169	4		1731											
30-49	Cham	1141	27	68	1211											
	Firewood															
20-29	Tsim	2390	56	45	966											
	Firewood															
10-19	Poles, etc.	4058	96	17	480											
	Firewood															
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	3.3	8%														
Thinning	26.1	62%														
Felling	13.0	31%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																
Geog	Merak	Comp.	2 Sakshum	Sub-Comp.	Wongor jab	No.	2a									
Areas in ha																
Non Forest Area	1.1	Protection	1.7	In-operable	27.4	Production	70.5									
Forest Composition and Description																
Unevenaged fir stand with average forest condition. There was good rhododendron sp regeneration in the sub-compartment.						Stand data										
						Bas. Area (m2/ha)	16.3									
						Volume (m3/ha)	344.5									
						Volume conifer %	86%									
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	94	Natural	100	Firewood	17	67				
						Spruce		Coppice		Bamboo						
						Mixed Conifer	6	Canopy	%	Cane						
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed	6							
						Hardwood		Open	78							
						Mixed H/C		Unstocked	17	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good		Grazing	39	56				
						Immature	6	Average	89	Shokshing						
						Mature	72	Poor	11	Lopping						
						Overmature	22	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	6	Stable	22	High	17											
Moderate	61	Moderate	28	Moderate	83											
Steep	33	Unstable	50	Low	6											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	1179	511	31	25	10	8	4	1	1	1	24	105	28			
Other Conifers	79	39														
Oak																
Acer			6	5	3							14	4			
Betula					5	1	0					6	2			
Rhododendron	1316	1336	138	11	2	2						154	41			
Other Broadleaves			50	34	7	1	0		1			94	25			
Total	2574	1886	226	75	28	13	5	1	1	1	24	372	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Felling of timber is recommended. Overmatured and hollow tree can be allotted as firewood.													
	Improvement		Frequent timber monitoring was felt necessary since the area is prone to illegal felling due to its proximity to settlement.													
	Timber Use	√														
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year												
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%
> 50	Drashing	706	10	70	6650											
	Firewood	833	12		7094											
30-49	Cham	819	12	67	1034											
	Firewood	1078	15		904											
20-29	Tsim	958	14	48	387											
	Firewood	1597	23		447											
10-19	Poles, etc.	444	6	58	52											
	Firewood	8871	126		599											
Silvicultural Measures				Area in ha implemented per year												
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%	
Planting																
Thinning																
Felling	62.7	89%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	2 Sakshum	Sub-Comp.	Wongor jab 2	No.	2b										
Areas in ha																	
Non Forest Area	5.6	Protection	5.6	In-operable	20.6	Production	52.9										
Forest Composition and Description																	
Fir dominant forest and has unevenaged stand having good regeneration.							Stand data										
							Bas. Area (m2/ha)	16.3									
							Volume (m3/ha)	344.5									
							Volume conifer %	86%									
<p>Number of trees/ha by diameter class (dbh>10cm)</p>							Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
							Hemlock		Plantation		Type	%	%				
							Fir	94	Natural	100	Firewood	17	67				
							Spruce		Coppice		Bamboo						
							Mixed Conifer	6	Canopy	%	Cane						
							Blue Pine		Dense		Daphne						
							Chir Pine		Closed	6							
							Hardwood		Open	78							
							Mixed H/C		Unstocked	17	Forest Use	I	E				
							Age Class	%	Condition	%	Type	%	%				
							Young		Good		Grazing	39	56				
							Immature	6	Average	89	Shokshing						
							Mature	72	Poor	11	Lopping						
							Overmature	22	Site Characteristics								
							Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	6	Stable	22	High	17												
Moderate	61	Moderate	28	Moderate	83												
Steep	33	Unstable	50	Low	6												
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	1179	511	31	25	10	8	4	1	1	1	24	105	28				
Other Conifers	79	39															
Oak																	
Acer			6	5	3							14	4				
Betula					5	1	0					6	2				
Rhododendron	1316	1336	138	11	2	2						154	41				
Other Broadleaves			50	34	7	1	0		1			94	25				
Total	2574	1886	226	75	28	13	5	1	1	1	24	372	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Felling of timber is recommended. Timely patrolling is required to curb down the illegal felling and lopping of the tree species.														
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	529	10	70	4987												
	Firewood	625	12		5320												
30-49	Cham	614	12	67	775												
	Firewood	809	15		678												
20-29	Tsim	719	14	48	290												
	Firewood	1198	23		335												
10-19	Poles, etc.	333	6	58	39												
	Firewood	6653	126		449												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning																	
Felling	47.0	89%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																
Geog	Merak	Comp.	2 Sakshum	Sub-Comp.	Sakshum	No.	2c									
Areas in ha																
Non Forest Area	11.5	Protection	0.4	In-operable	24.9	Production	60.6									
Forest Composition and Description																
Matur unevenaged fir forest having sparse regeneration. The condition of the forest was average with extensive grazing.						Stand data										
						Bas. Area (m2/ha)	19.8									
						Volume (m3/ha)	456.8									
						Volume conifer %	95%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	82	Natural	100	Firewood	12	65				
						Spruce		Coppice		Bamboo						
						Mixed Conifer	18	Canopy	%	Cane						
						Blue Pine		Dense	6	Daphne						
						Chir Pine		Closed	12							
						Hardwood		Open	76							
						Mixed H/C		Unstocked	6	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	6	Good	24	Grazing	29	59				
						Immature	29	Average	76	Shokshing						
						Mature	53	Poor		Lopping						
						Overmature	12	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle		Stable	12	High	18											
Moderate	41	Moderate	82	Moderate	76											
Steep	59	Unstable	6	Low	6											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	2184	312	60	29	21	10	9	2	2	0	27	160	38			
Other Conifers	21	187	33	12	7	1	2	1	1	0	5	63	15			
Oak																
Acer					1							1	0			
Betula			7		1	1	0					9	2			
Rhododendron	1456	1290	140	12	6							158	37			
Other Broadleaves			27	5								31	7			
Total	3662	1789	266	58	37	13	12	3	2	1	32	422	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Timber use is recommended.														
	Improvement															
	Timber Use	√														
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	1211	20	67	8376											
	Firewood	794	13		7706											
30-49	Cham	1694	28	74	1852											
	Firewood	519	9		323											
20-29	Tsim	1161	19	54	470											
	Firewood	726	12		177											
10-19	Poles, etc.	807	13	58	95											
	Firewood	8469	140		580											
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting																
Thinning	35.6	59%														
Felling	24.9	41%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																	
Geog	Merak	Comp.	2 Sakshum	Sub-Comp.	Dungmera-Charam	No.	2d										
Areas in ha																	
Non Forest Area	0.5	Protection	2.7	In-operable	19.2	Production	77.0										
Forest Composition and Description																	
Matured uneven age fir forest with evenly distributed stand. The regeneration was observed sparsely. Since the area was quite near to settlement lot of lopping was also noticed.						Stand data											
						Bas. Area (m2/ha)	12.5										
						Volume (m3/ha)	264.6										
						Volume conifer %	99%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	50	Natural	100	Firewood	25	60					
						Spruce		Coppice		Bamboo							
						Mixed Conifer	50	Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	15								
						Hardwood		Open	50								
						Mixed H/C		Unstocked	35	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	15	Good	10	Grazing	45	50					
						Immature	15	Average	90	Shokshing							
						Mature	50	Poor		Lopping							
						Overmature	20	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	10	Stable	15	High	5												
Moderate	50	Moderate	55	Moderate	75												
Steep	40	Unstable	30	Low	20												
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	654	336	23	18	16	12	5	1	1	1	16	92	57				
Other Conifers	230	265	23	16	10	4	2	1	1	1		58	36				
Oak																	
Acer																	
Betula			6	2								8	5				
Rhododendron	1167	1998		2	1							3	2				
Other Broadleaves																	
Total	2051	2600	51	39	27	16	6	2	2	1	16	161	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Improvement thinning and felling is recommended for timber use. Need to control excessive lopping of the trees.														
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	946	12	54	8343												
	Firewood	206	3		1259												
30-49	Cham	1444	19	49	1577												
	Firewood	177	2		193												
20-29	Tsim	941	12	42	380												
	Firewood	314	4		90												
10-19	Poles, etc.	436	6	22	51												
	Firewood	436	6		40												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	26.9	35%															
Felling	42.3	55%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																
Geog	Merak	Comp.	3 Serkemla-Sangtasa	Sub-Comp.	Sangtasa	No.	3a									
Areas in ha																
Non Forest Area	0.6	Protection	3.2	In-operable	9.0	Production	65.9									
Forest Composition and Description																
Fir forest with most of the overmatured trees are and canopy ranging from close to dense. Grazing was extensive and firewood were abundant.						Stand data										
						Bas. Area (m2/ha)	18.5									
						Volume (m3/ha)	309.5									
						Volume conifer %	81%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	100	Natural		Firewood	68	32				
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	23	Daphne						
						Chir Pine		Closed	59							
						Hardwood		Open	14							
						Mixed H/C		Unstocked	5	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	9	Good	27	Grazing		91				
						Immature	14	Average	23	Shokshing						
						Mature	36	Poor	50	Lopping						
						Overmature	41	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle		Stable	9	High	9					
						Moderate	91	Moderate	91	Moderate	77					
						Steep	9	Unstable		Low	14					
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	1350	868	72	26	26	14	6	2	2	2	14	164	41			
Other Conifers	64	64	5	7	4	1						17	4			
Oak																
Acer																
Betula			5	7	9	1	1					22	6			
Rhododendron	2026	2797	57	13								70	18			
Other Broadleaves	273	145	108	11	1						2	123	31			
Total	3714	3874	247	65	40	15	7	2	2	2	17	395	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Felling for timber and thinning for poles recommended. However, plantation is also required in the degraded and barren land inside the sub-compartment.														
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 80	Drashing	250	4	90	719											
	Firewood	1456	22		11309											
30-49	Cham	2084	32	100	2139											
	Firewood	1511	23		1495											
20-29	Tsim	1465	22	100	584											
	Firewood	2807	43		810											
10-19	Poles, etc.	4746	72	100	561											
	Firewood	11527	175		815											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	6.0	9%														
Thinning	35.9	55%														
Felling	24.0	36%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																
Geog	Merak	Comp.	3 Serkemla-Sangtasa	Sub-Comp.	Serkemla	No.	3b									
Areas in ha																
Non Forest Area	0.3	Protection	4.5	In-operable	15.0	Production	79.0									
Forest Composition and Description																
Fir forest with overmatured stand and good regeneration status. Canopy cover was closed with mostly overmatured trees.						Stand data										
						Bas. Area (m2/ha)	26.1									
						Volume (m3/ha)	382.0									
						Volume conifer %	82%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	100	Natural	100	Firewood	67	33				
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	24	Daphne						
						Chir Pine		Closed	57							
						Hardwood		Open	14							
						Mixed H/C		Unstocked	5	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	10	Good	29	Grazing		90				
						Immature	14	Average	24	Shokshing						
						Mature	33	Poor	48	Lopping						
						Overmature	43	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle		Stable	10	High	10					
						Moderate	90	Moderate	90	Moderate	76					
						Steep	10	Unstable		Low	14					
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	1415	909	75	74	36	21	10	3	2	2	16	237	41			
Other Conifers	67	67														
Oak																
Acer																
Betula			11	6	12	2	1					31	5			
Rhododendron	2021	2526	172	14								186	32			
Other Broadleaves	168	168	113	12	1						2	128	22			
Total	3672	3672	372	105	49	23	10	3	2	2	18	583	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Felling for timber and thinning for poles recommended. Plantation is also required in the degraded area.														
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	478	6	91	2271											
	Firewood	2029	26		14252											
30-49	Cham	2901	37	100	3116											
	Firewood	2728	35		2834											
20-29	Tsim	3218	41	100	1291											
	Firewood	5057	64		1725											
10-19	Poles, etc.	5960	75	100	704											
	Firewood	23412	296		1621											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	7.5	10%														
Thinning	41.4	52%														
Felling	30.1	38%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	3 Serkemla-Sangtasa	Sub-Comp.	Serkemla 2	No.	3c										
Areas in ha																	
Non Forest Area	0.2	Protection	6.2	In-operable	32.6	Production	69.9										
Forest Composition and Description																	
Fir forest with mostly matured stand having sign of decay and fir dieback. Rhododendron regeneration was abundant followed by fir.						Stand data											
						Bas. Area (m2/ha)	28.3										
						Volume (m3/ha)	748.6										
						Volume conifer %	90%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	93	Natural	100	Firewood	27	67					
						Spruce		Coppice		Bamboo							
						Mixed Conifer	7	Canopy	%	Cane							
						Blue Pine		Dense	13	Daphne							
						Chir Pine		Closed	47								
						Hardwood		Open	27								
						Mixed H/C		Unstocked	13	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	7	Good	20	Grazing		100					
						Immature	7	Average	13	Shokshing							
						Mature	53	Poor	67	Lopping							
						Overmature	33	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover							
Gentle	47	Stable	33	High	27												
Moderate	40	Moderate	60	Moderate	60												
Steep	13	Unstable	7	Low	13												
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	2264	189	60	27	19	14	11	6	2	3	53	196	35				
Other Conifers	24			3								3	0				
Oak																	
Acer			8	3	1							12	2				
Betula		47		3	6	2	1					11	2				
Rhododendron	4362	2004	174	57	4							235	42				
Other Broadleaves		118	83	14	4	1	1				2	104	19				
Total	6649	2358	324	106	35	17	13	6	2	3	55	560	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Timber and firewood uses are recommended. However, plantation is also felt important in some part of the sub-compartment. Need to regulate the grazing as it was found extensive in the area.														
	Improvement	√															
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year											Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	1809	26	100	14061												
	Firewood	3679	53		30697												
30-49	Cham	1555	22	100	1729												
	Firewood	2040	29		1934												
20-29	Tsim	1710	24	100	667												
	Firewood	5699	81		1480												
10-19	Poles, etc.	4221	60	100	499												
	Firewood	18468	264		1283												
Silvicultural Measures				Area in ha implemented per year											Total	%	
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	4.7	7%															
Thinning	28.0	40%															
Felling	37.3	53%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																	
Geog	Merak	Comp.	4 Phakchu	Sub-Comp.	Phakchu	No.	4a										
Areas in ha																	
Non Forest Area	2.3	Protection	0.8	In-operable	19.6	Production	78.5										
Forest Composition and Description																	
Fir forest having mostly mature to overmatured stand with closed canopy. The undergrowth vegetation was mostly dominated by rhododendron species.						Stand data											
						Bas. Area (m2/ha)	44.9										
						Volume (m3/ha)	588.8										
						Volume conifer %	89%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	100	Natural	100	Firewood	65	25					
						Spruce		Coppice		Bamboo							
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	75								
						Hardwood		Open	15								
						Mixed H/C		Unstocked	10	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good	25	Grazing	5	85					
						Immature	10	Average	55	Shokshing							
						Mature	65	Poor	20	Lopping							
						Overmature	25	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	50	Stable	30	High	25												
Moderate	25	Moderate	70	Moderate	65												
Steep	25	Unstable		Low	10												
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	283	1291	141	61	23	22	18	10	10	7	25	318	29				
Other Conifers	35	495		12	7	2						21	2				
Oak																	
Acer			11	6								17	2				
Betula		124		16	4							20	2				
Rhododendron	230	2971	673									673	62				
Other Broadleaves		212	17	22								39	4				
Total	548	5093	843	118	34	24	18	10	10	7	25	1090	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Improvement thinning required for pole size tree and felling for overmatured tree as firewood.															
	Improvement	√															
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	66	1	97	154												
	Firewood	5292	67		32294												
30-49	Cham	1864	24	96	1878												
	Firewood	2524	32		2898												
20-29	Tsim	4638	59	91	1844												
	Firewood	3838	49		1150												
10-19	Poles, etc.	10218	130	99	1208												
	Firewood	55086	702		3719												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	43.2	55%															
Felling	31.4	40%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																
Geog	Merak	Comp.	4 Phakchu	Sub-Comp.	Marzongjab	No.	4b									
Areas in ha																
Non Forest Area	1.3	Protection	1.4	In-operable	30.3	Production	45.5									
Forest Composition and Description																
Overall sub-compartment falls under matured age class with closed to dense canopy closure. It falls under fir forest with maximum rhododendron species undergrowth and firewood was abundant with matured trees.						Stand data										
						Bas. Area (m2/ha)	45.9									
						Volume (m3/ha)	524.0									
						Volume conifer %	79%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	100	Natural	100	Firewood	93	27				
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	20	Daphne						
						Chir Pine		Closed	67							
						Hardwood		Open	13							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	47	Grazing		87				
						Immature	7	Average	33	Shokshing						
						Mature	87	Poor	20	Lopping						
						Overmature	7	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	% %					
						Gentle	33	Stable	20	High	20					
						Moderate	33	Moderate	67	Moderate	67					
						Steep	33	Unstable	13	Low	13					
Species		Height	N/ha per diameter class										Total (> 10cm)			
		0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%		
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir		1580	967	106	84	26	19	14	7	4	5	21	286	24		
Other Conifers																
Oak																
Acer			47	15	5								21	2		
Betula			47	15	38	11							64	5		
Rhododendron		2594	1603	619	68								687	57		
Other Broadleaves		189	259	91	60	6							156	13		
Total		4362	2924	845	255	43	19	14	7	4	5	21	1213	100		
Future Management & Monitoring of Activities																
Manag. Option	No activities		Improvement thinning is recommended for opening up the space for fir regeneration. Felling of overmatured hollow tree for firewood is also required.													
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
Sokshing																
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 50	Drashing															
	Firewood	2283	50	100	14324											
30-49	Cham	870	19	100	837											
	Firewood	1959	43	100	2097											
20-29	Tsim	3211	71	100	1282											
	Firewood	8397	185	100	2405											
10-19	Poles, etc.	4802	106	100	568											
	Firewood	33616	739	100	2309											
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	30.3	67%														
Felling	9.1	20%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																																																																																																																																							
Geog	Merak	Comp.	4 Phakchu	Sub-Comp.	Marteng	No.	4c																																																																																																																																
Areas in ha																																																																																																																																							
Non Forest Area	1.1	Protection	5.5	In-operable	21.2	Production	67.3																																																																																																																																
Forest Composition and Description																																																																																																																																							
Fir forest with mostly matured age class and closed to dense canopy cover.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)	24.7																																																																																																																																
						Volume (m3/ha)	469.8																																																																																																																																
						Volume conifer %	87%																																																																																																																																
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>100</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>63</td> <td>26</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td></td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>42</td> <td>Daphne</td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>53</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>5</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td>26</td> <td>Good</td> <td>53</td> <td>Grazing</td> <td>16</td> <td>58</td> </tr> <tr> <td>Immature</td> <td>11</td> <td>Average</td> <td>26</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>47</td> <td>Poor</td> <td>21</td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td>16</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>26</td> <td>Stable</td> <td>47</td> <td>High</td> <td colspan="2">53</td> </tr> <tr> <td>Moderate</td> <td>63</td> <td>Moderate</td> <td>42</td> <td>Moderate</td> <td colspan="2">26</td> </tr> <tr> <td>Steep</td> <td>11</td> <td>Unstable</td> <td>11</td> <td>Low</td> <td colspan="2">21</td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	100	Natural	100	Firewood	63	26	Spruce		Coppice		Bamboo			Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense	42	Daphne			Chir Pine		Closed	53				Hardwood		Open	5				Mixed H/C		Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young	26	Good	53	Grazing	16	58	Immature	11	Average	26	Shokshing			Mature	47	Poor	21	Lopping			Overmature	16						Slope	%	Erosiveness	%	Soil Cover	%		Gentle	26	Stable	47	High	53		Moderate	63	Moderate	42	Moderate	26		Steep	11	Unstable	11	Low	21	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																	
Hemlock		Plantation		Type	%	%																																																																																																																																	
Fir	100	Natural	100	Firewood	63	26																																																																																																																																	
Spruce		Coppice		Bamboo																																																																																																																																			
Mixed Conifer		Canopy	%	Cane																																																																																																																																			
Blue Pine		Dense	42	Daphne																																																																																																																																			
Chir Pine		Closed	53																																																																																																																																				
Hardwood		Open	5																																																																																																																																				
Mixed H/C		Unstocked		Forest Use	I	E																																																																																																																																	
Age Class	%	Condition	%	Type	%	%																																																																																																																																	
Young	26	Good	53	Grazing	16	58																																																																																																																																	
Immature	11	Average	26	Shokshing																																																																																																																																			
Mature	47	Poor	21	Lopping																																																																																																																																			
Overmature	16																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																		
Gentle	26	Stable	47	High	53																																																																																																																																		
Moderate	63	Moderate	42	Moderate	26																																																																																																																																		
Steep	11	Unstable	11	Low	21																																																																																																																																		
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)																																																																																																																										
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Chirpine																																																																																																																																							
Bluepine																																																																																																																																							
Hemlock																																																																																																																																							
Spruce																																																																																																																																							
Fir	1359	707	83	54	39	20	8	4	3	3	24	238	51																																																																																																																										
Other Conifers	242	354																																																																																																																																					
Oak																																																																																																																																							
Acer			18	2								20	4																																																																																																																										
Betula			6	17	4						3	30	6																																																																																																																										
Rhododendron	2383	2457	101	13	1							115	25																																																																																																																										
Other Broadleaves			42	17	1	1						61	13																																																																																																																										
Total	3984	3518	250	103	46	21	8	4	3	3	27	465	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities		Improvement thinning is recommended. The plantation should be carried out since the likelihood of erosion is high in some pockets of the sub-compartment. The constant monitoring of the sub-compartment to regulate the grazing is crucial.																																																																																																																																				
	Improvement	√																																																																																																																																					
	Timber Use	√																																																																																																																																					
	Firewood Use	√																																																																																																																																					
	Silvopasture																																																																																																																																						
	Sokshing																																																																																																																																						
Production Potential (N, Volume)					No of trees removed each year										Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
>50	Drashing	157	2	97	420																																																																																																																																		
	Firewood	2788	41		22279																																																																																																																																		
30-49	Cham	1872	28	96	1899																																																																																																																																		
	Firewood	2480	37		2678																																																																																																																																		
20-29	Tsim	2596	39	96	1040																																																																																																																																		
	Firewood	4039	60		1272																																																																																																																																		
10-19	Poles, etc.	4808	71	93	568																																																																																																																																		
	Firewood	10817	161		785																																																																																																																																		
Silvicultural Measures					Area in ha implemented per year										Total	%																																																																																																																							
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
Planting	10.6	16%																																																																																																																																					
Thinning	35.4	53%																																																																																																																																					
Felling	17.7	26%																																																																																																																																					
Assessment carried out by		SWS										Year:	2019																																																																																																																										

Sub-Compartment Record																
Geog	Merak	Comp.	5 Damangjuk	Sub-Comp.	Damangjuk	No.	5a									
Areas in ha																
Non Forest Area	11.2	Protection	0.5	In-operable		Production	88.6									
Forest Composition and Description																
Fir forest with overmatured age class and canopy cover open to unstocked. Less regeneration in most of the area with heavy grazing.						Stand data										
						Bas. Area (m2/ha)	17.4									
						Volume (m3/ha)	467.3									
						Volume conifer %	90%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	100	Natural	100	Firewood	70	30				
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed	20							
						Hardwood		Open	45							
						Mixed H/C		Unstocked	35	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	5	Good	5	Grazing	40	60				
						Immature		Average	35	Shokshing						
						Mature	35	Poor	60	Lopping						
						Overmature	60	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	25	Stable	65	High												
Moderate	65	Moderate	35	Moderate	35											
Steep	10	Unstable		Low	65											
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	2794	283	17	10	3	1	3	2	3	7	33	79	19			
Other Conifers	53		17									17	4			
Oak																
Acer			136	4								140	33			
Betula			68	29								96	23			
Rhododendron	389	584	45									45	11			
Other Broadleaves			17	29								45	11			
Total	3236	867	300	71	3	1	3	2	3	7	33	424	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		The grazing need to be regulated and plantation is recommended. Overmatured trees can be marked for firewood.													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing															
	Firewood	4245	48	100	36296											
30-49	Cham	92	1	100	81											
	Firewood	295	3		330											
20-29	Tsim	722	8	100	292											
	Firewood	5592	63		1739											
10-19	Poles, etc.	3007	34	100	306											
	Firewood	23551	266		2337											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	62.0	70%														
Thinning																
Felling	26.6	30%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																
Geog	Merak	Comp.	5 Damangjuk	Sub-Comp.	Damangjuk 2	No.	5b									
Areas in ha																
Non Forest Area	3.0	Protection	2.4	In-operable	17.2	Production	90.3									
Forest Composition and Description																
Fir forest with matured stand and canopy cover closed to dense. Regeneration was quite good for fir and rhododendron species.						Stand data										
						Bas. Area (m2/ha)	23.5									
						Volume (m3/ha)	501.2									
						Volume conifer %	90%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	100	Natural	100	Firewood	67	29				
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	19	Daphne						
						Chir Pine		Closed	81							
						Hardwood		Open								
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	10	Good	43	Grazing	4.8	90				
						Immature	5	Average	33	Shokshing						
						Mature	62	Poor	24	Lopping						
						Overmature	24	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle		Stable	29	High	19					
						Moderate	29	Moderate	71	Moderate	81					
						Steep	71	Unstable		Low						
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	1903	539	92	25	19	16	7	4	3	2	32	201	35			
Other Conifers	118	135	11									11	2			
Oak																
Acer			27	8								35	6			
Betula		34	59	35	10							104	18			
Rhododendron	3503	1381	151	6								157	27			
Other Broadleaves		51	49	16								64	11			
Total	5524	2139	388	89	29	16	7	4	3	2	32	571	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Improvement thinning is recommended due to densed canopy closure. Need to monitor grazing in the sub-compartment.													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 80	Drashing		98													
	Firewood	4338		48	34713											
30-49	Cham	858	10	758												
	Firewood	2976	33	3304												
20-29	Tsim	2277	25	875												
	Firewood	5779	64	1848												
10-19	Poles, etc.	10215	113	1150												
	Firewood	24808	275	1906												
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	47.3	52%														
Felling	38.7	43%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record															
Geog	Merak	Comp.	5 Damangjuk	Sub-Comp.	Tshega	No.	5c								
Areas in ha															
Non Forest Area	1.6	Protection	2.1	In-operable	19.5	Production	78.1								
Forest Composition and Description															
Fir forest with closed canopy and age class ranging from mature to overmature in most of the stands. Overall undergrowth regeneration is good dominated by rhododendron and fir species.						Stand data									
						Bas. Area (m2/ha)	26.4								
						Volume (m3/ha)	541.3								
						Volume conifer %	88%								
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S			
						Hemlock		Plantation		Type	%	%			
						Fir	95	Natural	100	Firewood	70	30			
						Spruce		Coppice		Bamboo					
						Mixed Conifer	5	Canopy	%	Cane					
						Blue Pine		Dense	5	Daphne					
						Chir Pine		Closed	75						
						Hardwood		Open	20						
						Mixed H/C		Unstocked		Forest Use	I	E			
						Age Class	%	Condition	%	Type	%	%			
						Young	5	Good	25	Grazing	5	95			
						Immature	5	Average	30	Shokshing					
						Mature	60	Poor	45	Lopping					
						Overmature	30	Site Characteristics							
						Slope	%	Erosiveness	%	Soil Cover	%				
Gentle	25	Stable	50	High	50										
Moderate	25	Moderate	50	Moderate	50										
Steep	50	Unstable		Low											
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)		
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%		
Chirpine															
Bluepine															
Hemlock															
Spruce															
Fir	3395	778	68	29	12	9	6	5	4	3	35	171	24		
Other Conifers	141	566	68	2								70	10		
Oak															
Acer		35	96	22	1							120	17		
Betula			40	20	11							71	10		
Rhododendron	3484	2546	209	8								218	30		
Other Broadleaves		106	51	14	3							68	10		
Total	7021	4032	532	96	28	9	6	5	4	3	35	718	100		
Future Management & Monitoring of Activities															
Manag. Option	No activities		Thinning is recommended for creating space. Felling of old trees as a sanitation program is felt necessary.												
	Improvement	√													
	Timber Use														
	Firewood Use	√													
	Silvopasture														
	Sokshing														
Production Potential (N, Volume)				No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027		
>50	Drashing			98											
	Firewood	4049	52		32543										
30-49	Cham	325	4	93	285										
	Firewood	2344	30		2305										
20-29	Tsim	2070	26	100	826										
	Firewood	5413	69		1676										
10-19	Poles, etc.	7075	91	100	778										
	Firewood	34492	441		2841										
Silvicultural Measures				Area in ha implemented per year										Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting	7.8	10%													
Thinning	54.7	70%													
Felling	15.6	20%													
Assessment carried out by		SWS										Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	6 Gasejab -Jangphutse	Sub-Comp.	Gase-Lithejab 2	No.	6a										
Areas in ha																	
Non Forest Area	0.6	Protection	0.3	In-operable	27.7	Production	35.3										
Forest Composition and Description																	
The sub-compartment has mostly the matured fir stand with abundant young regeneration of fir in the open areas. The canopy closure mostly falls below 70%.						Stand data											
						Bas. Area (m2/ha)	18.0										
						Volume (m3/ha)	314.0										
						Volume conifer %	94%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	86	Natural	100	Firewood	21	71					
						Spruce		Coppice		Bamboo	7	7					
						Mixed Conifer		Canopy		Cane							
						Blue Pine		Dense	7	Daphne							
						Chir Pine		Closed	50								
						Hardwood		Open	43								
						Mixed H/C	14	Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	14	Good	36	Grazing	21	36					
						Immature		Average	50	Shokshing							
						Mature	64	Poor	14	Lopping							
						Overmature	21	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	29	Stable	50	High	43												
Moderate	57	Moderate	50	Moderate	57												
Steep	14	Unstable		Low													
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	2855	682	89	23	6	6	5	3	5	4	18	160	43				
Other Conifers	126	76	8		3	2	1					13	4				
Oak																	
Acer			8									8	2				
Betula																	
Rhododendron	1389	1011	137	17								155	42				
Other Broadleaves			16	15	1							32	9				
Total	4370	1768	259	55	10	8	6	3	5	4	18	368	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Felling of timber and firewood is recommended.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	754	21	76	4892												
	Firewood	207	6		2045												
30-49	Cham	400	11	74	461												
	Firewood	84	2		72												
20-29	Tsim	822	23	100	332												
	Firewood	1130	32		286												
10-19	Poles, etc.	3138	89	100	371												
	Firewood	5991	170		421												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	7.6	21%															
Felling	27.7	79%															
Assessment carried out by		SWS										Year:	2019				

Sub-Compartment Record																																																																																																																																				
Geog	Merak	Comp.	6 Gasejab -Jangphutse	Sub-Comp.	Gasejab-Marzong	No.	6b																																																																																																																													
Areas in ha																																																																																																																																				
Non Forest Area		Protection	1.1	In-operable	35.7	Production	63.4																																																																																																																													
Forest Composition and Description																																																																																																																																				
Fir forest with matured stand of 40-70% canopy closure. The good regeneration of fir and rhododendron species was coming up in the sub-compartment.						Stand data																																																																																																																														
						Bas. Area (m2/ha)	20.3																																																																																																																													
						Volume (m3/ha)	186.4																																																																																																																													
						Volume conifer %	96%																																																																																																																													
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>69</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>25</td> <td>56</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td></td> </tr> <tr> <td>Mixed Conifer</td> <td>31</td> <th>Canopy</th> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>6</td> <td>Daphne</td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>63</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>31</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <th>Forest Use</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>13</td> <td>Grazing</td> <td>19</td> <td>50</td> </tr> <tr> <td>Immature</td> <td>38</td> <td>Average</td> <td>81</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>63</td> <td>Poor</td> <td>6</td> <td>Lopping</td> <td>6.3</td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <th>Site Characteristics</th> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th>%</th> <td></td> </tr> <tr> <td>Gentle</td> <td>69</td> <td>Stable</td> <td>75</td> <td>High</td> <td>44</td> <td></td> </tr> <tr> <td>Moderate</td> <td>19</td> <td>Moderate</td> <td>25</td> <td>Moderate</td> <td>50</td> <td></td> </tr> <tr> <td>Steep</td> <td>13</td> <td>Unstable</td> <td></td> <td>Low</td> <td>6</td> <td></td> </tr> </tbody> </table>	Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	69	Natural	100	Firewood	25	56	Spruce		Coppice		Bamboo			Mixed Conifer	31	Canopy	%	Cane			Blue Pine		Dense	6	Daphne			Chir Pine		Closed	63				Hardwood		Open	31				Mixed H/C		Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	13	Grazing	19	50	Immature	38	Average	81	Shokshing			Mature	63	Poor	6	Lopping	6.3		Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	69	Stable	75	High	44		Moderate	19	Moderate	25	Moderate	50		Steep	13	Unstable		Low	6	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																														
Hemlock		Plantation		Type	%	%																																																																																																																														
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Blue Pine		Dense	6	Daphne																																																																																																																																
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Mixed H/C		Unstocked		Forest Use	I	E																																																																																																																														
Age Class	%	Condition	%	Type	%	%																																																																																																																														
Young		Good	13	Grazing	19	50																																																																																																																														
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Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																															
Gentle	69	Stable	75	High	44																																																																																																																															
Moderate	19	Moderate	25	Moderate	50																																																																																																																															
Steep	13	Unstable		Low	6																																																																																																																															
Species	Height	N/ha per diameter class											Total (> 10cm)																																																																																																																							
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																							
Chirpine																																																																																																																																				
Bluepine																																																																																																																																				
Hemlock																																																																																																																																				
Spruce																																																																																																																																				
Fir	1326	884	127	69	22	11	7	8	3	2	2	251	71																																																																																																																							
Other Conifers	133	88		46			1	0				47	13																																																																																																																							
Oak																																																																																																																																				
Acer				5	1	1						7	2																																																																																																																							
Betula				5								5	1																																																																																																																							
Rhododendron	1459	906	42									42	12																																																																																																																							
Other Broadleaves																																																																																																																																				
Total	2918	1879	170	125	23	12	7	9	3	2	2	352	100																																																																																																																							
Future Management & Monitoring of Activities																																																																																																																																				
Manag. Option	No activities		Timber and poles can be extracted.																																																																																																																																	
	Improvement																																																																																																																																			
	Timber Use	√																																																																																																																																		
	Firewood Use																																																																																																																																			
	Silvopasture																																																																																																																																			
	Sokshing																																																																																																																																			
Production Potential (N, Volume)				No of trees removed each year											Total	%																																																																																																																				
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																						
>50	Drashing	960	15	80	3176																																																																																																																															
	Firewood	177	3		716																																																																																																																															
30-49	Cham	1171	18	90	1091																																																																																																																															
	Firewood	828	13		1027																																																																																																																															
20-29	Tsim	4362	69	88	1742																																																																																																																															
	Firewood	2585	41		729																																																																																																																															
10-19	Poles, etc.	8079	127	100	955																																																																																																																															
	Firewood	2693	42		179																																																																																																																															
Silvicultural Measures				Area in ha implemented per year											Total	%																																																																																																																				
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																							
Planting																																																																																																																																				
Thinning	23.8	38%																																																																																																																																		
Felling	23.8	38%																																																																																																																																		
Assessment carried out by				SWS									Year:	2019																																																																																																																						

Sub-Compartment Record																
Geog	Merak	Comp.	6 Gasejab -Jangphutse	Sub-Comp.	Gasejab-Marzong 2	No.	6c									
Areas in ha																
Non Forest Area		Protection	2.8	In-operable	17.3	Production	30.8									
Forest Composition and Description																
Fir forest with closed canopy and average forest condition. There was good regeneration of fir and rhododendron species and the grazing was extensive in the sub-compartment.						Stand data										
						Bas. Area (m2/ha)	20.1									
						Volume (m3/ha)	185.4									
						Volume conifer %	96%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	75	Natural	100	Firewood	25	56				
						Spruce		Coppice		Bamboo						
						Mixed Conifer	25	Canopy	%	Cane						
						Blue Pine		Dense	6	Daphne						
						Chir Pine		Closed	63							
						Hardwood		Open	31							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	13	Grazing	19	50				
						Immature	38	Average	81	Shokshing						
						Mature	63	Poor	6	Lopping	6.3					
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	% %					
Gentle	69	Stable	75	High	44											
Moderate	19	Moderate	25	Moderate	50											
Steep	13	Unstable		Low	6											
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	1105	884	127	69	22	11	7	8	3	2	2	250	71			
Other Conifers	133	88		46			1	0				47	13			
Oak																
Acer				5	1	1						7	2			
Betula				5								5	1			
Rhododendron	1326	884	42									42	12			
Other Broadleaves																
Total	2564	1857	170	125	23	12	7	9	3	2	2	352	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Timber and poles can be extracted on thinning basis.													
	Improvement															
	Timber Use	√														
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year												
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%
> 50	Drashing	459	15	80	1502											
	Firewood	86	3		348											
30-49	Cham	569	18	90	530											
	Firewood	403	13		499											
20-29	Tsim	2120	69	88	847											
	Firewood	1256	41		354											
10-19	Poles, etc.	3925	127	100	464											
	Firewood	1308	42		87											
Silvicultural Measures				Area in ha implemented per year												
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%
Planting																
Thinning	11.6	38%														
Felling	11.6	38%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																
Geog	Merak	Comp.	6 Gasejab -Jangphutse	Sub-Comp.	epchungnang-Songri	No.	6d									
Areas in ha																
Non Forest Area	4.7	Protection	0.8	In-operable	11.2	Production	82.5									
Forest Composition and Description																
Matured fir stand with abundant fir regeneration and rhododendron sp. The 1/3 rd of the area was burnt by fire in the past and the area was mostly opened. The canopy was less than 40% and majority of the area was used for grazing land (tsamdro).						Stand data										
						Bas. Area (m2/ha)	13.2									
						Volume (m3/ha)	274.8									
						Volume conifer %	94%									
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	64	Natural	100	Firewood	5	77				
						Spruce		Coppice		Bamboo						
						Mixed Conifer	14	Canopy		Cane						
						Blue Pine		Dense	5	Daphne						
						Chir Pine		Closed	23							
						Hardwood		Open	68							
						Mixed H/C	23	Unstocked	5	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	9	Good	5	Grazing	14	45				
						Immature	23	Average	68	Shokshing						
						Mature	50	Poor	27	Lopping	18	4.5				
						Overmature	18	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	41	Stable	68	High	45											
Moderate	36	Moderate	32	Moderate	45											
Steep	23	Unstable		Low	9											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	1447	338	103	19	11	5	1	2	3	3	17	165	62			
Other Conifers	80															
Oak																
Acer				4								4	1			
Betula				15	3					0		18	7			
Rhododendron	1977	916	46									46	17			
Other Broadleaves			31	4								35	13			
Total	3505	1254	180	41	14	5	1	2	3	4	17	268	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Timber, firewood and poles can be extracted from the area.													
	Improvement															
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 50	Drashing	814	10	80	5910											
	Firewood	1006	12		8181											
30-49	Cham	1296	16	95	1301											
	Firewood	219	3		275											
20-29	Tsim	2292	28	100	877											
	Firewood	1069	13		337											
10-19	Poles, etc.	8487	103	100	1003											
	Firewood	6366	77		435											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	22.5	27%														
Felling	22.5	27%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	6 Gasejab -Jangputse	Sub-Comp.	Nimdroma-Maelung	No.	6e										
Areas in ha																	
Non Forest Area	0.1	Protection	1.8	In-operable	34.9	Production	62.1										
Forest Composition and Description																	
Matured fir stand having mostly diameter above 90cm with abundant fir and rhododendron regenerations. The overmatured stand were mostly deformed and top broken.						Stand data											
						Bas. Area (m2/ha)	29.8										
						Volume (m3/ha)	740.0										
						Volume conifer %	95%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	100	Natural	100	Firewood	25	75					
						Spruce		Coppice		Bamboo							
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	56								
						Hardwood		Open	44								
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	13	Good	13	Grazing	25	69					
						Immature		Average	75	Shokshing							
						Mature	63	Poor	13	Lopping	19	6.3					
						Overmature	25	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	50	Stable	31	High	25												
Moderate	31	Moderate	69	Moderate	75												
Steep	19	Unstable		Low													
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	1592	486	120	15	1	8	8	12	7	9	52	233	41				
Other Conifers	398	22															
Oak																	
Acer			78	15	1							94	17				
Betula				5	1							6	1				
Rhododendron	1348	928	184									184	33				
Other Broadleaves			42	3		1						46	8				
Total	3338	1437	424	38	4	9	8	12	7	9	52	563	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Timber and firewood fellings are recommended.														
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	1323	21	84	6872												
	Firewood	3271	53		28909												
30-49	Cham	584	9	94	711												
	Firewood	146	2		208												
20-29	Tsim	1265	20	100	491												
	Firewood	1107	18		347												
10-19	Poles, etc.	7466	120	100	882												
	Firewood	18884	304		1514												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	7.8	13%															
Felling	54.3	88%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																	
Geog	Merak	Comp.	6 Gasejab -Jangphutse	Sub-Comp.	Melung-Jangphutse	No.	6f										
Areas in ha																	
Non Forest Area		Protection	3.4	In-operable	42.6	Production	33.5										
Forest Composition and Description																	
Matured fir stand with good regeneration of fir and rhododendron. Grazing was extensive in some pockets of the area.						Stand data											
						Bas. Area (m2/ha)	15.5										
						Volume (m3/ha)	124.7										
						Volume conifer %	88%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	100	Natural	100	Firewood	82	18					
						Spruce		Coppice		Bamboo							
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	55								
						Hardwood		Open	45								
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good		Grazing	45	55					
						Immature		Average	100	Shokshing							
						Mature	55	Poor		Lopping	9.1						
						Overmature	45	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	% %						
Gentle	27	Stable	73	High	18												
Moderate	36	Moderate	27	Moderate	55												
Steep	36	Unstable		Low	27												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	2122	1318	62	30	25	15	11	4	2	0	147	46					
Other Conifers																	
Oak																	
Acer																	
Betula			21								21	6					
Rhododendron	868	804	113	7							121	37					
Other Broadleaves			31	4							35	11					
Total	2990	2122	226	41	25	15	11	4	2	0	323	100					
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Thinning of young fir stand for timber and poles recommended. Matured tree can be felled for timber and firewood.														
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	179	5	100	481												
	Firewood	374	11		1089												
30-49	Cham	533	16	85	565												
	Firewood	584	17		684												
20-29	Tsim	620	19	91	251												
	Firewood	620	19		193												
10-19	Poles, etc.	2755	82	100	308												
	Firewood	4821	144		326												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	18.3	55%															
Felling	9.1	27%															
Assessment carried out by		SWS												Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	7Dothrabthrab-Betheng	Sub-Comp.	Lethe-Sumthengjug	No.	7a										
Areas in ha																	
Non Forest Area	0.0	Protection	0.4	In-operable	29.5	Production	12.6										
Forest Composition and Description																	
Dominated by mixed conifer and mixed H/C. The stands are matured with young regeneration in the open areas. The canopy closure ranges from 40-70% and the bamboo regeneration was abundant in the sub-compartment.						Stand data											
						Bas. Area (m2/ha)	13.7										
						Volume (m3/ha)	214.3										
						Volume conifer %	89%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	33	Natural	100	Firewood		67					
						Spruce		Coppice		Bamboo	33	17					
						Mixed Conifer	50	Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	67								
						Hardwood		Open	17								
						Mixed H/C	17	Unstocked	17	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	17	Good	33	Grazing	50	33					
						Immature		Average	50	Shokshing							
						Mature	83	Poor	17	Lopping	17						
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%	%					
Gentle	17	Stable	33	High	17												
Moderate	83	Moderate	67	Moderate	67												
Steep		Unstable		Low	17												
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock	1533	354				4		1		1	7	13	8				
Spruce																	
Fir	589	354	19		14	4			1	1	4	43	25				
Other Conifers	118	59				6	1					8	4				
Oak																	
Acer				7								7	4				
Betula				7								7	4				
Rhododendron	1002	707	57	20	17							94	55				
Other Broadleaves																	
Total	3242	1474	75	34	31	15	1	1	1	2	11	172	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Felling for firewood and timber is recommended.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	78	6	37	490												
	Firewood																
30-49	Cham	334	26	95	365												
	Firewood	219	17		125												
20-29	Tsim			100													
	Firewood	429	34		117												
10-19	Poles, etc.	238	19	100	28												
	Firewood	715	57		48												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning																	
Felling	10.5	83%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	7 Dothrabthrab-Betheng	Sub-Comp.	Gase-Lithejab	No.	7b										
Areas in ha																	
Non Forest Area	1.5	Protection	1.3	In-operable	29.8	Production	37.9										
Forest Composition and Description																	
The sub-compartment has mostly the matured fir stand with abundant young regeneration of fir in the open areas. In some closed stand, the undergrowth was mostly covered by the rhododendrons. The canopy closure mostly falls below 70%.						Stand data											
						Bas. Area (m2/ha)	18.0										
						Volume (m3/ha)	314.0										
						Volume conifer %	94%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	86	Natural	100	Firewood	21	71					
						Spruce		Coppice		Bamboo	7	7					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense	7	Daphne							
						Chir Pine		Closed	50								
						Hardwood		Open	43								
						Mixed H/C	14	Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	14	Good	36	Grazing	21	36					
						Immature		Average	50	Shokshing							
						Mature	64	Poor	14	Lopping							
						Overmature	21	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover							
Gentle	29	Stable	50	High	43												
Moderate	57	Moderate	50	Moderate	57												
Steep	14	Unstable		Low													
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	2855	682	89	23	6	6	5	3	5	4	18	160	43				
Other Conifers	126	76	8		3	2	1					13	4				
Oak																	
Acer			8									8	2				
Betula																	
Rhododendron	1389	1011	137	17								155	42				
Other Broadleaves			16	15	1							32	9				
Total	4370	1768	259	55	10	8	6	3	5	4	18	368	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Felling of timber and firewood is highly feasible in the sub-compartment.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	811	21	76	5260												
	Firewood	223	6		2199												
30-49	Cham	430	11	74	495												
	Firewood	90	2		78												
20-29	Tsim	883	23	100	357												
	Firewood	1215	32		308												
10-19	Poles, etc.	3374	89	100	399												
	Firewood	6442	170		453												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	8.1	21%															
Felling	29.8	79%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																	
Geog	Merak	Comp.	7 Dothrabthrab-Betheng	Sub-Comp.	Dothrabthrab-Betheng	No.	7c										
Areas in ha																	
Non Forest Area	1.2	Protection	1.2	In-operable	33.7	Production	59.9										
Forest Composition and Description																	
Matured fir stand with rhododendron undergrowth. In the higher elevation, the stands are mostly mixed with juniper sp.						Stand data											
						Bas. Area (m2/ha)	22.6										
						Volume (m3/ha)	215.7										
						Volume conifer %	93%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	81	Natural	100	Firewood		81					
						Spruce		Coppice		Bamboo		6					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense	25	Daphne							
						Chir Pine		Closed	75								
						Hardwood		Open									
						Mixed H/C	19	Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good	63	Grazing	13	38					
						Immature		Average	38	Shokshing							
						Mature	100	Poor		Lopping							
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	38	Stable	63	High	56												
Moderate	63	Moderate	38	Moderate	44												
Steep		Unstable		Low													
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	1945	575	57	18	26	20	12	8	5	6	2	153	49				
Other Conifers	575	66															
Oak																	
Acer																	
Betula																	
Rhododendron	641	243	99	23								122	39				
Other Broadleaves			35	3								38	12				
Total	3161	884	191	43	26	20	12	8	5	6	2	313	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Felling for timber and firewood recommended.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	1491	25	78	5369												
	Firewood	53	1		229												
30-49	Cham	2344	39	86	2659												
	Firewood																
20-29	Tsim	1068	18	100	432												
	Firewood	1526	25		366												
10-19	Poles, etc.	3391	57	100	401												
	Firewood	8054	134		546												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning																	
Felling	59.9	100%															
Assessment carried out by		Merak											Year:	2019			

Sub-Compartment Record																	
Geog	Merak	Comp.	8Gasabjuk-Rongbrenng	Sub-Comp.	Gasabjuk	No.	8a										
Areas in ha																	
Non Forest Area	0.0	Protection	7.8	In-operable	79.6	Production	3.3										
Forest Composition and Description																	
Hemlock stand with immature stand and closed canopy. Grazing was intensive and bamboo abundant.						Stand data											
						Bas. Area (m2/ha)	26.0										
						Volume (m3/ha)	232.6										
						Volume conifer %	72%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock	100	Plantation		Type	%	%					
						Fir		Natural	100	Firewood		100					
						Spruce		Coppice		Bamboo	100						
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	100								
						Hardwood		Open									
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good		Grazing	100						
						Immature	100	Average	100	Shokshing							
						Mature		Poor		Lopping							
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle		Stable		High													
Moderate		Moderate	100	Moderate	100												
Steep	100	Unstable		Low													
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock	707	707			42	13	8		5	7	3	77	54				
Spruce																	
Fir																	
Other Conifers																	
Oak																	
Acer																	
Betula					42	13						54	38				
Rhododendron	707	354															
Other Broadleaves						13						13	9				
Total	1415	1061			83	38	8		5	7	3	144	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Plantation recommended for improvement.														
	Improvement	√															
	Timber Use																
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	33	10	63	263												
	Firewood	15	5		71												
30-49	Cham			21													
	Firewood	83	25		109												
20-29	Tsim			###													
	Firewood																
10-19	Poles, etc.			###													
	Firewood																
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	3.3	100%															
Thinning																	
Felling																	
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	8Gasabjuk-Rongbrenng	Sub-Comp.	Sazur	No.	8b										
Areas in ha																	
Non Forest Area		Protection	1.0	In-operable	31.3	Production	33.9										
Forest Composition and Description																	
Fir forest with mostly matured stand on the moderate slope. Forest condition was average with extensive grazing and lopping.						Stand data											
						Bas. Area (m2/ha)	18.3										
						Volume (m3/ha)	659.1										
						Volume conifer %	93%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	100	Natural	100	Firewood	15	77					
						Spruce		Coppice		Bamboo		31					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense	23	Daphne							
						Chir Pine		Closed	38								
						Hardwood		Open	38								
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	15	Good	46	Grazing	7.7	54					
						Immature	23	Average	46	Shokshing							
						Mature	54	Poor	8	Lopping	7.7	46					
						Overmature	8	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	% %						
Gentle	15	Stable	85	High	46												
Moderate	54	Moderate	15	Moderate	54												
Steep	31	Unstable		Low													
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock	82	27	9	3								12	3				
Spruce																	
Fir	925	680	52	13	6	5	1	2	3	2	54	138	38				
Other Conifers		27															
Oak																	
Acer			44	22	2		1		0			68	19				
Betula		27	52	16	6		1	1		0		77	21				
Rhododendron	1197	1415	44									44	12				
Other Broadleaves			17	3	2							22	6				
Total	2204	2176	218	56	16	5	3	3	3	2	54	360	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Timber and firewood extraction on thinning basis recommended.															
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	815	24	98	7064												
	Firewood	1373	40		13133												
30-49	Cham	207	6	68	239												
	Firewood	271	8		201												
20-29	Tsim	213	6	67	70												
	Firewood	1063	31		342												
10-19	Poles, etc.	591	17	48	47												
	Firewood	2953	87		264												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	13.0	38%															
Felling	13.0	38%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	8Gasabjuk-Rongbrenng	Sub-Comp.	Rongbrenng	No.	8c										
Areas in ha																	
Non Forest Area	1.5	Protection		In-operable	14.6	Production	27.1										
Forest Composition and Description																	
Mostly matured stand with stable site condition and moderate soil cover. Grazing and lopping was observed extensive in the area.						Stand data											
						Bas. Area (m2/ha)	19.7										
						Volume (m3/ha)	956.7										
						Volume conifer %	96%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	100	Natural	100	Firewood	15	77					
						Spruce		Coppice		Bamboo	8	8					
						Mixed Conifer		Canopy	%	Cane		8					
						Blue Pine		Dense	8	Daphne		15					
						Chir Pine		Closed	38	Paris sp		8					
						Hardwood		Open	38								
						Mixed H/C		Unstocked	15	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	31	Good	38	Grazing	15	85					
						Immature	15	Average	62	Shokshing							
						Mature	46	Poor		Lopping							
						Overmature	8	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	31	Stable	62	High	15												
Moderate	31	Moderate	38	Moderate	62												
Steep	38	Unstable		Low	23												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock					3							3	1				
Spruce																	
Fir	843	463	44	34	6	3	1	1	1	1	85	176	52				
Other Conifers	27																
Oak																	
Acer	54			16	6	1						23	7				
Betula	136		9	16	3	1	3	0				32	9				
Rhododendron	1143	626	26	6								32	10				
Other Broadleaves			52	19	3							74	22				
Total	2204	1088	131	94	19	5	4	1	1	1	85	341	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Timber felling recommended.															
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Shokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	1350	50	99	13125												
	Firewood	1117	41		10884												
30-49	Cham	52	2	55	72												
	Firewood	303	11		219												
20-29	Tsim	85	3	43	29												
	Firewood	1018	38		297												
10-19	Poles, etc.			33													
	Firewood	1179	44		88												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	8.3	31%															
Felling	18.7	69%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																	
Geog	Merak	Comp.	9 Phrengla-Gomthe	Sub-Comp.	Donglo	No.	9a										
Areas in ha																	
Non Forest Area	9.2	Protection	1.4	In-operable	11.6	Production	34.7										
Forest Composition and Description																	
Mixed forest types with fir being the dominant. The forest condition was good with mostly matured stand. The presence of snag trees due to past forest fire was also observed.						Stand data											
						Bas. Area (m2/ha)	14.7										
						Volume (m3/ha)	461.7										
						Volume conifer %	95%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock	33	Plantation		Type	%	%					
						Fir	53	Natural	100	Firewood	33	53					
						Spruce		Coppice		Bamboo	13	60					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense	7	Daphne	13	40					
						Chir Pine		Closed	33								
						Hardwood	7	Open	47								
						Mixed H/C	7	Unstocked	13	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	13	Good	67	Grazing		93					
						Immature	13	Average	33	Shokshing							
						Mature	73	Poor		Lopping		67					
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%	%					
Gentle	7	Stable	93	High		73											
Moderate	67	Moderate	7	Moderate		20											
Steep	27	Unstable		Low		7											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock	1014	165		3	8	2	1	1		0	15	30	9				
Spruce																	
Fir	589	212	15	8	11	8	4	2	1	2	17	68	20				
Other Conifers	24	24		3	1					0		4	1				
Oak																	
Acer			15	5								21	6				
Betula			8	3								10	3				
Rhododendron	2499	2004	196	8								204	61				
Other Broadleaves						1						1	0				
Total	4126	2405	234	30	21	11	5	3	1	2	31	338	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Timber use recommended on thinning basis. Also need to regulate the grazing.															
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	1280	37	99	12038												
	Firewood	166	5		1880												
30-49	Cham	850	24	80	920												
	Firewood	29	1		36												
20-29	Tsim	283	8	55	96												
	Firewood	283	8		67												
10-19	Poles, etc.	262	8	81	24												
	Firewood	6289	181		419												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	2.3	7%															
Felling	25.5	73%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																
Geog	Merak	Comp.	9 Phrengla-Gomthe	Sub-Comp.	Gomthe	No.	9b									
Areas in ha																
Non Forest Area	9.9	Protection	2.8	In-operable	27.9	Production	41.8									
Forest Composition and Description																
Hemlock forest with matured stand having close to dense canopy. Grazing was extensive and bamboo abundant.						Stand data										
						Bas. Area (m2/ha)	14.8									
						Volume (m3/ha)	433.7									
						Volume conifer %	98%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock	87	Plantation		Type	%	%				
						Fir	13	Natural	100	Firewood	20	67				
						Spruce		Coppice		Bamboo	60	20				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	27	Daphne						
						Chir Pine		Closed	40							
						Hardwood		Open	20							
						Mixed H/C		Unstocked	13	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	7	Good	67	Grazing	6.7	87				
						Immature		Average	27	Shokshing						
						Mature	93	Poor	7	Lopping	6.7	6.7				
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	7	Stable	73	High	60											
Moderate	40	Moderate	27	Moderate	33											
Steep	53	Unstable		Low	7											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock	731	118	15	14	14	11	3	4	4	4	20	88	44			
Spruce																
Fir	283	24			4					0	6	10	5			
Other Conifers	165	47		5	6	2		1	0			14	7			
Oak																
Acer																
Betula					1							1	1			
Rhododendron	2334	1556	83		1							84	43			
Other Broadleaves																
Total	3513	1745	98	19	26	13	3	4	4	4	25	197	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	<input type="checkbox"/>	Felling of timber recommended.													
	Improvement	<input type="checkbox"/>														
	Timber Use	<input checked="" type="checkbox"/>														
	Firewood Use	<input type="checkbox"/>														
	Silvopasture	<input type="checkbox"/>														
	Sokshing	<input type="checkbox"/>														
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	1049	25	62	8516											
	Firewood	17	0		56											
30-49	Cham	1417	34	94	1347											
	Firewood	116	3		76											
20-29	Tsim	568	14	71	179											
	Firewood															
10-19	Poles, etc.	315	8	77	29											
	Firewood	2838	68		189											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	8.4	20%														
Felling	33.4	80%														
Assessment carried out by				SWS										Year:	2019	

Sub-Compartment Record																
Geog	Merak	Comp.	9 Phrengla-Gomthe	Sub-Comp.	Nangchenma	No.	9c									
Areas in ha																
Non Forest Area	3.3	Protection	4.2	In-operable	24.8	Production	37.3									
Forest Composition and Description																
Dominated by hemlock forest followed by fir. Stands are mostly matured with dense canopy cover. Bamboo were found abundant and grazing extensive.						Stand data										
						Bas. Area (m2/ha)	14.4									
						Volume (m3/ha)	825.3									
						Volume conifer %	97%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock	53	Plantation		Type	%	%				
						Fir	33	Natural	100	Firewood	27	40				
						Spruce		Coppice		Bamboo	33	27				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	40	Daphne						
						Chir Pine		Closed	33							
						Hardwood	13	Open	27							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	47	Grazing	33	47				
						Immature	20	Average	53	Shokshing						
						Mature	67	Poor		Lopping						
						Overmature	13	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%	%				
Gentle	40	Stable	73	High	40											
Moderate	33	Moderate	27	Moderate	33											
Steep	27	Unstable		Low	27											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock	165	71				2	1	4	3	1	31	42	15			
Spruce																
Fir	118	189						1	0	0	33	35	13			
Other Conifers				3	1							4	1			
Oak																
Acer																
Betula			23	5	1			1				30	11			
Rhododendron	118	236	113	35	6	2						156	57			
Other Broadleaves			8									8	3			
Total	401	495	143	43	8	3	1	6	3	2	64	274	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Timber use recommended.														
	Improvement															
	Timber Use	√														
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)					No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 50	Drashing	2057	55	80	23005											
	Firewood	188	5		1924											
30-49	Cham	31	1	57	42											
	Firewood	217	6		153											
20-29	Tsim			13												
	Firewood	202	5		48											
10-19	Poles, etc.			5												
	Firewood	281	8		20											
Silvicultural Measures					Area in ha implemented per year										Total	%
Measure	Area (ha)	in %														
Planting																
Thinning	7.5	20%														
Felling	27.3	73%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																	
Geog	Merak	Comp.	9 Phrengla-Gomthe	Sub-Comp.	Phrenglateng	No.	9d										
Areas in ha																	
Non Forest Area	5.7	Protection	0.9	In-operable	22.5	Production	33.8										
Forest Composition and Description																	
Fir forest having closed canopy and mostly matured stand. Slope mostly moderate and are stable. Grazing was observed intensively in the sub-compartment.						Stand data											
						Bas. Area (m2/ha)	17.3										
						Volume (m3/ha)	400.0										
						Volume conifer %	90%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock	13	Plantation		Type	%	%					
						Fir	87	Natural	100	Firewood	40	60					
						Spruce		Coppice		Bamboo	33	40					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense	7	Daphne		13					
						Chir Pine		Closed	40								
						Hardwood		Open	53								
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good	47	Grazing	60	47					
						Immature	7	Average	53	Shokshing							
						Mature	93	Poor		Lopping		60					
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	% %						
Gentle	27	Stable	67	High	60												
Moderate	53	Moderate	33	Moderate	33												
Steep	20	Unstable		Low	7												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock	377	165				1	0	0	0	5	7	2					
Spruce																	
Fir	2004	495	30	30	11	8	3	3	2	3	20	110	37				
Other Conifers						1	0				2	1					
Oak																	
Acer			15	24	1							41	14				
Betula			53	14	3	2	1					71	24				
Rhododendron	3018	637	45	14	3	2						63	21				
Other Broadleaves				5					0			6	2				
Total	5399	1297	143	87	18	12	5	4	3	3	25	300	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Felling for timber and firewood recommended.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	1107	33	84	10205												
	Firewood	24	1		86												
30-49	Cham	630	19	88	716												
	Firewood	254	8		229												
20-29	Tsim	919	27	66	371												
	Firewood	1010	30		297												
10-19	Poles, etc.	765	23	68	90												
	Firewood	2551	75		209												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	2.3	7%															
Thinning																	
Felling	24.8	73%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																	
Geog	Merak	Comp.	10 Kheliphu	Sub-Comp.	Panglem Breng	No.	10a										
Areas in ha																	
Non Forest Area	0.2	Protection	7.1	In-operable	19.5	Production	50.1										
Forest Composition and Description																	
Hardwood forest with mature stand. The sub-compartment was heavily grazed and lopped.						Stand data											
						Bas. Area (m2/ha)	8.2										
						Tot. Vol. (m3/ha)	233.6										
						Vconifer %	1%										
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir		Natural	100	Firewood	11	67					
						Spruce		Coppice		Bamboo	61	28					
						Mixed Conifer		Canopy	%	Cane	6	11					
						Blue Pine		Dense		Daphne		22					
						Chir Pine		Closed	17								
						Hardwood	100	Open	67								
						Mixed H/C		Unstocked	17	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	11	Good	22	Grazing	83	5.6					
						Immature	39	Average	61	Shokshing							
						Mature	50	Poor	17	Lopping	33	33					
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	17	Stable	56	High	22												
Moderate	44	Moderate	44	Moderate	56												
Steep	39	Unstable		Low	22												
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Beilschmiedia spp.																	
Cinnamomum spp.																	
Exbucklandia						1	0			0	4	5	6				
Litsea spp.																	
Michelia spp.																	
Persea spp.	39	20		2	1			0	1	0	4	9	10				
Quercus spp.	39	39				1						1	1				
Schima spp.				2				0		0	6	9	10				
Walnut		39	19	11	2	2	2	0				37	41				
Other Broadleave	98	138		11	6	3	1	1	1	1	3	28	31				
Conifer spp.	39					1			0			2	2				
Total	216	236	19	27	9	8	4	2	2	2	17	91	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Timber can be harvested on thinning basis.														
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	975	19	72	8679												
	Firewood																
30-49	Cham			4													
	Firewood	35	1		51												
20-29	Tsim																
	Firewood																
10-19	Poles, etc.																
	Firewood																
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	16.7	33%															
Thinning	25.1	50%															
Felling	5.6	11%															
Assessment carried out by			SWS											Year:	2019		

Sub-Compartment Record																																																																																																																																			
Geog	Merak	Comp.	10 Kheliphu	Sub-Comp.	Jatasa	No.	10b																																																																																																																												
Areas in ha																																																																																																																																			
Non Forest Area	8.3	Protection	5.9	In-operable		Production	25.8																																																																																																																												
Forest Composition and Description																																																																																																																																			
The sub-compartment is located near the settlement. The stand were heavily lopped and grazed by livestock. The thick growth of bamboo was also observed.						Stand data																																																																																																																													
						Bas. Area (m2/ha)	5.5																																																																																																																												
						Tot. Vol. (m3/ha)	243.8																																																																																																																												
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																							
						Hemlock		Plantation		Type	%	%																																																																																																																							
<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>73</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>47</td> <td>27</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td></td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td>40</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>7</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>40</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>53</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <td colspan="2">Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td>7</td> <td>Good</td> <td>13</td> <td>Grazing</td> <td>67</td> <td>13</td> </tr> <tr> <td>Immature</td> <td>33</td> <td>Average</td> <td>40</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>60</td> <td>Poor</td> <td>47</td> <td>Lopping</td> <td>40</td> <td>13</td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="2">Site Characteristics</td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="2">Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td>%</td> </tr> <tr> <td>Gentle</td> <td>47</td> <td>Stable</td> <td>47</td> <td>High</td> <td></td> <td>7</td> </tr> <tr> <td>Moderate</td> <td></td> <td>Moderate</td> <td></td> <td>Moderate</td> <td></td> <td>40</td> </tr> <tr> <td>Steep</td> <td>53</td> <td>Unstable</td> <td>53</td> <td>Low</td> <td></td> <td>53</td> </tr> </tbody> </table>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Fir		Natural	100	Firewood		73	Spruce		Coppice		Bamboo	47	27	Mixed Conifer		Canopy		Cane			Blue Pine		Dense		Daphne		40	Chir Pine		Closed	7				Hardwood	100	Open	40				Mixed H/C		Unstocked	53	Forest Use	I	E	Age Class		%	Condition	%	Type	%	%	Young	7	Good	13	Grazing	67	13	Immature	33	Average	40	Shokshing			Mature	60	Poor	47	Lopping	40	13	Overmature		Site Characteristics					Slope		%	Erosiveness	%	Soil Cover	%	Gentle	47	Stable	47	High		7	Moderate		Moderate		Moderate		40	Steep	53	Unstable	53	Low		53						
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																							
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Steep	53	Unstable	53	Low		53																																																																																																																													
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Schima spp.																																																																																																																																			
Walnut					3		1					3	8																																																																																																																						
Other Broadleave	71	94			4	2	3		2	0	2	12	30																																																																																																																						
Conifer spp.																																																																																																																																			
Total	71	94			5	8	3		2	2	15	41	100																																																																																																																						
Future Management & Monitoring of Activities																																																																																																																																			
Manag. Option	No activities	Planting of local species is recommended.																																																																																																																																	
	Improvement	√																																																																																																																																	
	Timber Use																																																																																																																																		
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Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																		
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																					
>50	Drashing	227	9	57	2173																																																																																																																														
	Firewood	116	5		1282																																																																																																																														
30-49	Cham	22	1	14	27																																																																																																																														
	Firewood	22	1		32																																																																																																																														
20-29	Tsim																																																																																																																																		
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10-19	Poles, etc.			###																																																																																																																															
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Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																		
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																						
Planting	15.5	60%																																																																																																																																	
Thinning	10.3	40%																																																																																																																																	
Felling																																																																																																																																			
Assessment carried out by				SWS										Year:	2019																																																																																																																				

Sub-Compartment Record																																																																																																																																				
Geog	Merak	Comp.	10 Kheliphu	Sub-Comp.	Labtsa Khandronang	No.	10c																																																																																																																													
Areas in ha																																																																																																																																				
Non Forest Area	8.0	Protection		In-operable	7.5	Production	86.3																																																																																																																													
Forest Composition and Description																																																																																																																																				
Stands were matured with open to closed canopy. Slopes were moderate with stable site condition and grazing was extensive. Bamboo and firewood were sparsely distributed.							Stand data																																																																																																																													
							Bas. Area (m2/ha)	12.3																																																																																																																												
							Tot. Vol. (m3/ha)	75.3																																																																																																																												
							Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																							
							Hemlock		Plantation		Type	%	%																																																																																																																							
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							Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																							
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Steep	9	Unstable		Low		26																																																																																																																														
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																								
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																							
Beilschmiedia spp.																																																																																																																																				
Cinnamomum spp.		31		2	1	1						3	1																																																																																																																							
Exbucklandia					2							2	1																																																																																																																							
Litsea spp.																																																																																																																																				
Michelia spp.																																																																																																																																				
Persea spp.	15	31																																																																																																																																		
Quercus spp.				2	1	1						4	1																																																																																																																							
Schima spp.		31		7		1	0					9	3																																																																																																																							
Walnut			44	25	17	4	0					91	35																																																																																																																							
Other Broadleave	584	569	84	44	18	4	1	0				152	58																																																																																																																							
Conifer spp.																																																																																																																																				
Total	600	661	128	80	39	11	2	0				260	100																																																																																																																							
Future Management & Monitoring of Activities																																																																																																																																				
Manag. Option	No activities	Felling for timber use is recommended.																																																																																																																																		
	Improvement																																																																																																																																			
	Timber Use	√																																																																																																																																		
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	Silvopasture																																																																																																																																			
	Sokshing																																																																																																																																			
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																			
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																						
>50	Drashing		35																																																																																																																																	
	Firewood	63	1		125																																																																																																																															
30-49	Cham	2907	34	95	2228																																																																																																																															
	Firewood	1236	14		1054																																																																																																																															
20-29	Tsim	5353	62	98	1464																																																																																																																															
	Firewood	1376	16		389																																																																																																																															
10-19	Poles, etc.	8921	103	88	627																																																																																																																															
	Firewood	850	10		60																																																																																																																															
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																			
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																						
Planting	15.0	17%																																																																																																																																		
Thinning	30.0	35%																																																																																																																																		
Felling	41.3	48%																																																																																																																																		
Assessment carried out by		Sws												Year:	2019																																																																																																																					

Sub-Compartment Record																
Geog	Merak	Comp.	10 Kheliphu	Sub-Comp.	Tagaisa Thsezur	No.	10d									
Areas in ha																
Non Forest Area	4.9	Protection	10.1	In-operable	18.9	Production	40.2									
Forest Composition and Description																
Hardwood forest type with matured stand. Grazing was observed extensively in the area.						Stand data										
						Bas. Area (m2/ha)	9.9									
						Tot. Vol. (m3/ha)	71.3									
						Vconifer %										
<p>Number of trees/ha by diameter class (dbh>10 cm)</p> <p>Legend: Conifer spp., Schima spp., Michelia spp., Cinnamomum spp., Other Broadleaved, Quercus spp., Litsea spp., Beilschmiedia spp., Walnut, Persea spp., Exbucklandia</p>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
					Hemlock		Plantation		Type	%	%					
					Fir		Natural	100	Firewood	6	94					
					Spruce		Coppice		Bamboo	24	71					
					Mixed Conifer		Canopy	%	Cane							
					Blue Pine		Dense		Daphne		88					
					Chir Pine		Closed	53								
					Hardwood	100	Open	47								
					Mixed H/C		Unstocked		Forest Use		I	E				
					Age Class	%	Condition	%	Type	%	%					
					Young	6	Good	41	Grazing		100					
					Immature	18	Average	59	Shokshing							
					Mature	76	Poor		Lopping							
					Overmature		Site Characteristics									
					Slope	%	Erosiveness	%	Soil Cover	%						
					Gentle	6	Stable	12	High							
					Moderate	82	Moderate	88	Moderate	76						
					Steep	12	Unstable		Low	24						
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.	21															
Cinnamomum spp.		21		5	2	1						8	6			
Exbucklandia	21	42														
Litsea spp.	42	21		2								2	2			
Michelia spp.																
Persea spp.	42	21														
Quercus spp.		62		2	4	1	1		1	0		10	7			
Schima spp.	42	104	7	7	7	4	1	2				29	20			
Walnut		42	7	5								11	8			
Other Broadleaved	250	187	33	29	11	5	1	1		0		80	57			
Conifer spp.																
Total	416	499	47	50	24	12	4	3	1	0		141	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Felling for firewood is recommended with plantation in some of the open area.														
	Improvement															
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing		97	862												
	Firewood	303	8													
30-49	Cham	384	10	306												
	Firewood	1076	27	958												
20-29	Tsim	771	19	222												
	Firewood	1061	26	286												
10-19	Poles, etc.	268	7	23												
	Firewood	1339	33	94												
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	18.9	47%														
Thinning																
Felling	21.3	53%														
Assessment carried out by				SWS										Year:	2019	

Sub-Compartment Record																	
Geog	Merak	Comp.	10 Kheliphu	Sub-Comp.	Phromshing Bompo	No.	10e										
Areas in ha																	
Non Forest Area		Protection	1.0	In-operable	3.9	Production	93.0										
Forest Composition and Description																	
Mature to overmature stand with thick bamboo growth. The grazing and loppings were intensive in the sub-compartment.							Stand data										
							Bas. Area (m2/ha)					6.2					
							Tot. Vol. (m3/ha)					531.2					
							Vconifer %										
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>							Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
							Hemlock		Plantation		Type	%	%				
							Fir		Natural	100	Firewood	38	63				
							Spruce		Coppice		Bamboo	33	25				
							Mixed Conifer		Canopy	%	Cane						
							Blue Pine		Dense		Daphne	17	29				
							Chir Pine		Closed	17							
							Hardwood	100	Open	75							
							Mixed H/C		Unstocked	8	Forest Use	I	E				
							Age Class	%	Condition	%	Type	%	%				
							Young	8	Good	29	Grazing	96					
							Immature	29	Average	63	Shokshing						
							Mature	63	Poor	8	Lopping	63	33				
							Overmature		Site Characteristics								
							Slope	%	Erosiveness	%	Soil Cover	%					
							Gentle	17	Stable	79	High	13					
							Moderate	63	Moderate	21	Moderate	75					
							Steep	21	Unstable		Low	13					
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Beilschmiedia spp.																	
Cinnamomum spp.						1	0	1				2	3				
Exbucklandia											2	2	3				
Litsea spp.																	
Michelia spp.					1				0	8	9	15					
Persea spp.							1	1	0	0	4	6	10				
Quercus spp.					1	1	0	1		1	5	9	14				
Schima spp.						2	2	1	1	1	27	33	55				
Walnut																	
Other Broadleave	44	29															
Conifer spp.																	
Total	44	29			1	4	3	4	1	2	46	61	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Thinning and felling of matured and overmatured trees are highly recommended.														
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	4353	47	97	40900												
	Firewood	675	7		7610												
30-49	Cham																
	Firewood	129	1	27	135												
20-29	Tsim			###													
	Firewood																
10-19	Poles, etc.			###													
	Firewood																
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	11.6	13%															
Thinning	34.9	38%															
Felling	46.5	50%															
Assessment carried out by		SWS										Year:	2019				

Sub-Compartment Record																																																																																																																																									
Geog	Merak	Comp.	10 Kheliphu	Sub-Comp.	Phrangmoteng	No.	10f																																																																																																																																		
Areas in ha																																																																																																																																									
Non Forest Area	2.4	Protection	0.6	In-operable	13.8	Production	72.3																																																																																																																																		
Forest Composition and Description																																																																																																																																									
The stands were matured with mostly open canopy and average condition. The area was heavily grazed leading to poor regeneration.						Stand data																																																																																																																																			
						Bas. Area (m2/ha)	13.0																																																																																																																																		
						Tot. Vol. (m3/ha)	513.0																																																																																																																																		
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>38</td> <td>52</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>19</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td>24</td> <td>52</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>24</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>76</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <th colspan="2">Forest Use</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td>5</td> <td>Good</td> <td>33</td> <td>Grazing</td> <td>90</td> <td>9.5</td> </tr> <tr> <td>Immature</td> <td>29</td> <td>Average</td> <td>62</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>57</td> <td>Poor</td> <td>5</td> <td>Lopping</td> <td>67</td> <td>19</td> </tr> <tr> <td>Overmature</td> <td>10</td> <th colspan="4">Site Characteristics</th> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td></td> <td>Stable</td> <td>67</td> <td>High</td> <td colspan="2">10</td> </tr> <tr> <td>Moderate</td> <td>38</td> <td>Moderate</td> <td>33</td> <td>Moderate</td> <td colspan="2">76</td> </tr> <tr> <td>Steep</td> <td>62</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2">14</td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood	38	52	Spruce		Coppice		Bamboo		19	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne	24	52	Chir Pine		Closed	24				Hardwood	100	Open	76				Mixed H/C		Unstocked		Forest Use		I	E	Age Class	%	Condition	%	Type	%	%	Young	5	Good	33	Grazing	90	9.5	Immature	29	Average	62	Shokshing			Mature	57	Poor	5	Lopping	67	19	Overmature	10	Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle		Stable	67	High	10		Moderate	38	Moderate	33	Moderate	76		Steep	62	Unstable		Low	14	
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																													
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Age Class	%	Condition	%	Type	%	%																																																																																																																																			
Young	5	Good	33	Grazing	90	9.5																																																																																																																																			
Immature	29	Average	62	Shokshing																																																																																																																																					
Mature	57	Poor	5	Lopping	67	19																																																																																																																																			
Overmature	10	Site Characteristics																																																																																																																																							
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																				
Gentle		Stable	67	High	10																																																																																																																																				
Moderate	38	Moderate	33	Moderate	76																																																																																																																																				
Steep	62	Unstable		Low	14																																																																																																																																				
Species	Height	N/ha per diameter class										Total (> 10cm)																																																																																																																													
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																												
Beilschmiedia spp.																																																																																																																																									
Cinnamomum spp.																																																																																																																																									
Exbucklandia																																																																																																																																									
Litsea spp.																																																																																																																																									
Michelia spp.										1		1	1																																																																																																																												
Persea spp.			11		2	3	1	1	1	8		27	28																																																																																																																												
Quercus spp.	34				2	2	1	1	1	0		7	7																																																																																																																												
Schima spp.				4		2	3	2	2	10		24	24																																																																																																																												
Walnut					1		1	1	0			3	3																																																																																																																												
Other Broadleave	51	34	11					1	2	21		36	37																																																																																																																												
Conifer spp.																																																																																																																																									
Total	84	34	22	4	5	3	6	7	5	7	39	97	100																																																																																																																												
Future Management & Monitoring of Activities																																																																																																																																									
Manag. Option	No activities		Recommended for thinning and felling for timber use. The grazing should be controlled for better regeneration in the area.																																																																																																																																						
	Improvement																																																																																																																																								
	Timber Use	√																																																																																																																																							
	Firewood Use																																																																																																																																								
	Silvopasture																																																																																																																																								
	Sokshing																																																																																																																																								
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																								
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
>50	Drashing	3680	51	83	33510																																																																																																																																				
	Firewood	135	2		521																																																																																																																																				
30-49	Cham																																																																																																																																								
	Firewood	143	2	25	113																																																																																																																																				
20-29	Tsim																																																																																																																																								
	Firewood																																																																																																																																								
10-19	Poles, etc.																																																																																																																																								
	Firewood																																																																																																																																								
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																								
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																												
Planting	13.8	19%																																																																																																																																							
Thinning	34.4	48%																																																																																																																																							
Felling	24.1	33%																																																																																																																																							
Assessment carried out by		SWS											Year:	2019																																																																																																																											

Sub-Compartment Record																																																																																																																																									
Geog	Merak	Comp.	10 Kheliphu	Sub-Comp.	arkelamo Moshimoju	No.	10g																																																																																																																																		
Areas in ha																																																																																																																																									
Non Forest Area	0.5	Protection		In-operable		Production	67.4																																																																																																																																		
Forest Composition and Description																																																																																																																																									
Matured stand with open canopy and moderate soil cover. Condition of the hardwood forest is average.							Stand data																																																																																																																																		
							Bas. Area (m2/ha)	12.1																																																																																																																																	
							Tot. Vol. (m3/ha)	96.4																																																																																																																																	
							Vconifer %																																																																																																																																		
							<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>36</td> <td>60</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>92</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td>36</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>24</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>76</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>4</td> <td>Grazing</td> <td></td> <td>100</td> </tr> <tr> <td>Immature</td> <td>8</td> <td>Average</td> <td>96</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>92</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="4">Site Characteristics</td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td></td> <td>Stable</td> <td>40</td> <td>High</td> <td colspan="2">4</td> </tr> <tr> <td>Moderate</td> <td>40</td> <td>Moderate</td> <td>60</td> <td>Moderate</td> <td colspan="2">56</td> </tr> <tr> <td>Steep</td> <td>60</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2">40</td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood	36	60	Spruce		Coppice		Bamboo		92	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne		36	Chir Pine		Closed	24				Hardwood	100	Open	76				Mixed H/C		Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	4	Grazing		100	Immature	8	Average	96	Shokshing			Mature	92	Poor		Lopping			Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle		Stable	40	High	4		Moderate	40	Moderate	60	Moderate	56		Steep	60	Unstable		Low	40	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																			
Hemlock		Plantation		Type	%	%																																																																																																																																			
Fir		Natural	100	Firewood	36	60																																																																																																																																			
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Chir Pine		Closed	24																																																																																																																																						
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Mixed H/C		Unstocked		Forest Use	I	E																																																																																																																																			
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Young		Good	4	Grazing		100																																																																																																																																			
Immature	8	Average	96	Shokshing																																																																																																																																					
Mature	92	Poor		Lopping																																																																																																																																					
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Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																				
Gentle		Stable	40	High	4																																																																																																																																				
Moderate	40	Moderate	60	Moderate	56																																																																																																																																				
Steep	60	Unstable		Low	40																																																																																																																																				
Species	Height	N/ha per diameter class										Total (> 10cm)																																																																																																																													
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																												
Beilschmiedia spp.																																																																																																																																									
Cinnamomum spp.			9	2	2	2						15	11																																																																																																																												
Exbucklandia				2	2							3	2																																																																																																																												
Litsea spp.				2	1							2	2																																																																																																																												
Michelia spp.						1	1	0	0			2	2																																																																																																																												
Persea spp.			5	5	5	2						16	12																																																																																																																												
Quercus spp.			9	7	7	4	3	1	0			30	22																																																																																																																												
Schima spp.			23	8	9	5	3	1	1			50	36																																																																																																																												
Walnut					2	1		0				3	2																																																																																																																												
Other Broadleave	99	156		7	5	2	2	1	0			17	12																																																																																																																												
Conifer spp.																																																																																																																																									
Total	99	156	45	31	32	15	9	4	2			138	100																																																																																																																												
Future Management & Monitoring of Activities																																																																																																																																									
Manag. Option	No activities	Firewood recommended.																																																																																																																																							
	Improvement																																																																																																																																								
	Timber Use																																																																																																																																								
	Firewood Use																																																																																																																																								
	Silvopasture																																																																																																																																								
	Sokshing																																																																																																																																								
Production Potential (N, Volume)				No of trees removed each year																																																																																																																																					
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																									
> 50	Drashing	148	2	90	414																																																																																																																																				
	Firewood	761	11		2040																																																																																																																																				
30-49	Cham	506	8	98	427																																																																																																																																				
	Firewood	2607	39		2379																																																																																																																																				
20-29	Tsim	439	7	100	129																																																																																																																																				
	Firewood	1648	24		497																																																																																																																																				
10-19	Poles, etc.	610	9	100	52																																																																																																																																				
	Firewood	2441	36		194																																																																																																																																				
Silvicultural Measures				Area in ha implemented per year																																																																																																																																					
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																									
Planting																																																																																																																																									
Thinning	13.5	20%																																																																																																																																							
Felling	51.2	76%																																																																																																																																							
Assessment carried out by		SWS										Year:	2019																																																																																																																												

Sub-Compartment Record																
Geog	Merak	Comp.	11Khashiteng	Sub-Comp.	Gaytay Shushulaga	No.	11a									
Areas in ha																
Non Forest Area	8.9	Protection	2.8	In-operable	27.7	Production	49.2									
Forest Composition and Description																
Forest type is hardwood with moderate soil cover having closed to open canopy cover. Age class mostly falls under immature class. Grazing was extensive with sparsely distributed NWFPs.						Stand data										
						Bas. Area (m2/ha)	14.4									
						Tot. Vol. (m3/ha)	107.7									
						Vconifer %										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood		100				
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed	44							
						Hardwood	100	Open	56							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	19	Good		Grazing		100				
						Immature	81	Average	100	Shokshing						
						Mature		Poor		Lopping						
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	19	Stable	69	High												
Moderate	63	Moderate	31	Moderate												
Steep	19	Unstable		Low	100											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.																
Exbucklandia																
Litsea spp.																
Michelia spp.																
Persea spp.																
Quercus spp.	155	177	120	71	21	11	3	1	1	0		228	84			
Schima spp.					1		1					2	1			
Walnut																
Other Broadleave	44	133	14	10	8	5	3	0				40	15			
Conifer spp.																
Total	199	309	134	81	30	16	6	2	1	0		271	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Thinning and plantation in degraded area of the sub-compartment are recommended.													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	148	3	96	342											
	Firewood	282	6		897											
30-49	Cham	513	10	100	459											
	Firewood	1732	35		1722											
20-29	Tsim	502	10	100	136											
	Firewood	3511	71		1161											
10-19	Poles, etc.	697	14	100	49											
	Firewood	5921	120		479											
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	36.9	75%														
Thinning	21.5	44%														
Felling																
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																																																																																																																																								
Geog	Merak	Comp.	11Khashiteng	Sub-Comp.	Chumagpo	No.	11b																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	10.6	Protection	2.1	In-operable	17.5	Production	31.1																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Overall sub-compartment falls under immature age class of timber with open canopy. Grazing was extensive with sparsely distributed NWFPs.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	14.5																																																																																																																																	
						Tot. Vol. (m3/ha)	133.8																																																																																																																																	
						Vconifer %																																																																																																																																		
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew. Type</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>19</td> <td>81</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>56</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>31</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>69</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <td>Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>13</td> <td>Grazing</td> <td>6.3</td> <td>94</td> </tr> <tr> <td>Immature</td> <td>75</td> <td>Average</td> <td>88</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>25</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td>6.3</td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="4">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <td>Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td colspan="2">%</td> </tr> <tr> <td>Gentle</td> <td></td> <td>Stable</td> <td>69</td> <td>High</td> <td colspan="2">6</td> </tr> <tr> <td>Moderate</td> <td>31</td> <td>Moderate</td> <td>31</td> <td>Moderate</td> <td colspan="2">25</td> </tr> <tr> <td>Steep</td> <td>69</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2">69</td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew. Type	A	S	Hemlock		Plantation					Fir		Natural	100	Firewood	19	81	Spruce		Coppice		Bamboo		56	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne			Chir Pine		Closed	31				Hardwood	100	Open	69				Mixed H/C		Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	13	Grazing	6.3	94	Immature	75	Average	88	Shokshing			Mature	25	Poor		Lopping		6.3	Overmature		Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle		Stable	69	High	6		Moderate	31	Moderate	31	Moderate	25		Steep	69	Unstable		Low	69	
Forest Type	%	Stand Type	%	NWFP+firew. Type	A	S																																																																																																																																		
Hemlock		Plantation																																																																																																																																						
Fir		Natural	100	Firewood	19	81																																																																																																																																		
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Mature	25	Poor		Lopping		6.3																																																																																																																																		
Overmature		Site Characteristics																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle		Stable	69	High	6																																																																																																																																			
Moderate	31	Moderate	31	Moderate	25																																																																																																																																			
Steep	69	Unstable		Low	69																																																																																																																																			
Species		Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																											
			<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Beilschmiedia spp.																																																																																																																																								
Cinnamomum spp.																																																																																																																																								
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Schima spp.																																																																																																																																								
Walnut																																																																																																																																								
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Conifer spp.																																																																																																																																								
Total		44	133		18	22	24	12	7	3	2		88	100																																																																																																																										
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>50	Drashing	104	3	85	273																																																																																																																																			
	Firewood	521	17		1784																																																																																																																																			
30-49	Cham	316	10	90	320																																																																																																																																			
	Firewood	989	32		1076																																																																																																																																			
20-29	Tsim	158	5	86	43																																																																																																																																			
	Firewood	316	10		100																																																																																																																																			
10-19	Poles, etc.			###																																																																																																																																				
	Firewood																																																																																																																																							
Silvicultural Measures				Area in ha implemented per year											Total	%																																																																																																																								
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting	9.7	31%																																																																																																																																						
Thinning	23.3	75%																																																																																																																																						
Felling	7.8	25%																																																																																																																																						
Assessment carried out by		SWS											Year:	2019																																																																																																																										

Sub-Compartment Record																																																																																																																																							
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Areas in ha																																																																																																																																							
Non Forest Area	7.3	Protection		In-operable	17.7	Production	37.7																																																																																																																																
Forest Composition and Description																																																																																																																																							
Hardwood forest with overall young and immature stands.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)	12.1																																																																																																																																
						Tot. Vol. (m3/ha)	129.4																																																																																																																																
						Vconifer %																																																																																																																																	
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>24</td> <td>71</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>18</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>29</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>35</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>35</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td>65</td> <td>Good</td> <td>59</td> <td>Grazing</td> <td>53</td> <td>47</td> </tr> <tr> <td>Immature</td> <td>18</td> <td>Average</td> <td>35</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>18</td> <td>Poor</td> <td>6</td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="4">Site Characteristics</td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>6</td> <td>Stable</td> <td>82</td> <td>High</td> <td colspan="2">41</td> </tr> <tr> <td>Moderate</td> <td>59</td> <td>Moderate</td> <td>18</td> <td>Moderate</td> <td colspan="2">53</td> </tr> <tr> <td>Steep</td> <td>35</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2">6</td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood	24	71	Spruce		Coppice		Bamboo		18	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne			Chir Pine		Closed	29				Hardwood	100	Open	35				Mixed H/C		Unstocked	35	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young	65	Good	59	Grazing	53	47	Immature	18	Average	35	Shokshing			Mature	18	Poor	6	Lopping			Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	6	Stable	82	High	41		Moderate	59	Moderate	18	Moderate	53		Steep	35	Unstable		Low	6	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																	
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Steep	35	Unstable		Low	6																																																																																																																																		
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																											
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
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Quercus spp.	250	166	13	12	9	5	2	1	1			43	25																																																																																																																										
Schima spp.	42				4	1	1				2	7	4																																																																																																																										
Walnut																																																																																																																																							
Other Broadleave	374	291	47	48	15	6	4	1	1	1	2	123	71																																																																																																																										
Conifer spp.																																																																																																																																							
Total	666	458	60	60	27	12	7	1	1	1	4	174	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities		Thinning for firewood and plantation is recommended.																																																																																																																																				
	Improvement	√																																																																																																																																					
	Timber Use																																																																																																																																						
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	Silvopasture																																																																																																																																						
	Sokshing																																																																																																																																						
Production Potential (N, Volume)				No of trees removed each year																																																																																																																																			
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																							
>50	Drashing	327	9	99	2063																																																																																																																																		
	Firewood	233	6		662																																																																																																																																		
30-49	Cham	333	9	53	341																																																																																																																																		
	Firewood	434	12		367																																																																																																																																		
20-29	Tsim	722	19	48	212																																																																																																																																		
	Firewood	361	10		98																																																																																																																																		
10-19	Poles, etc.	502	13	22	35																																																																																																																																		
	Firewood																																																																																																																																						
Silvicultural Measures				Area in ha implemented per year																																																																																																																																			
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																							
Planting	13.3	35%																																																																																																																																					
Thinning	19.9	53%																																																																																																																																					
Felling	8.9	24%																																																																																																																																					
Assessment carried out by		SWS											Year:	2019																																																																																																																									

Annexure 14: Compiled Results by Compartment for Sakteng FMA

Area Distribution, Basal Area and No. of Sample Plots for Forest Management Area: Sakteng

Comp	Sub-Compartment		Area Distribution (ha)					BA (m ² /ha)	No. of Plots
	No.	Name	Non Forest Area	Protection	Inoperable	Production	Total		
1	a	Dombrok	0.6	2.6	7.7	56.4	67.3	19.5	22
1	b	Zhengtsangteng	0.5	2.7	18.8	75.4	97.4	29.1	20
1	c	Kenperi	0.6	1.3	14.85	78	94.75	15	21
1	d	Lhabrateng	0.1	0.2	3.9	94.4	98.6	21.6	24
1	e	Dakpashisa		0.8	15.1	79.3	95.2	24	21
1	f	Donglumarpo	1			99	100	19	25
1	g	Goigoberi	24.8		29.1	26.8	80.7	19.2	12
1	h	Jabgoenpa	5.6	2.6	25.6	65.7	99.5	23.7	18
2	a	Layphrangma	0.2	3.1	12.2	89.5	105	16.7	22
2	b	Tsherzom		3.4	27.2	69.9	100.5	23.4	18
2	c	Balung	9.9	2	24.5	63.1	99.5	22.7	18
2	d	Brakshaktang	32.2	3	30.4	45.6	111.2	21.2	15
3	a	Sangtangsa	2.4	3.4	15	78.8	99.6	18.8	21
3	b	Zomla	3.5	2.3	7.8	90.2	103.8	14.6	23
3	c	Borantse 1	1.7	3.4	12	88.3	105.4	21.2	22
3	d	Borantse 2	13.4	1.2	38.5	49.1	102.2	36.6	14
4	a	Chunakpo	7.5	2.1	29.2	61.9	100.7	15.8	17
4	b	Domsagang		1.5	74.4	23.5	99.4	14.3	6
4	c	Rangnga	1.5	5.1	50.7	39.8	97.1	18.5	11
4	d	Chabchuna	9.1	0.9	44.1	47.8	101.9	26	13
4	e	Naglagang	10.3	1.4	19.1	76.5	107.3	15.5	20
5	c	Zhemshatsey	1.5	5.1	48.8	45	100.4	29.7	12
5	d	Gothorong	2.7	0.8	26.7	68.8	99	24.9	18
5	e	Nuglu	16.2	3.1	28.2	50.1	97.6	18.1	16
6	a	Rinakpo	22.7	1.8	55.8	31.4	111.7	21.3	9
6	b	Nahizhong	9.8	2.5	26	55.1	93.4	17.1	17
6	c	Saleyrong	10.7	2	52	29.3	94	16	9
6	d	Meserteng	20.5	2.4	43.1	28.7	94.7	15.4	10
7	a	Tsebchen-Mangdi	13.5	1.4	19.4	61.5	95.8	27.5	19
7	b	Bethangtse	18.2	1.5	24	50.9	94.6	45.4	17
8	a	Mirkhe	10.2	1.8	30.1	53.6	95.7	22.8	16
8	b	Broksar	10.5	4.2	27.2	57.7	99.6	20.1	17
8	c	Yardam	10	2.8	44.5	41.1	98.4	29.5	12
8	d	Laitse		8.6	67.8	21.4	97.8	16.7	6
8	e	Throngbro	2.7	4.4	29.1	61.9	98.1	18.1	17
9	a	Benangtse	22.9	7.2	17.5	69.9	117.5	17.9	20
9	b	Tabkangbro	1.8	5.3	28.6	60.9	96.6	18	17
9	c	Zampakhajuk	1.8	10.9	32.4	35.2	80.3	20.5	13
9	d	Bainangtse	0.8	3.2	6.7	77.1	87.8	20.3	23
9	e	Namthengtse	41.4	2.7	22.3	39.6	106	13.8	16
9	f	Khenphutse	21	3.2	37.8	48.2	110.2	24.1	14
9	g	Prabo	7.1	9.7	29.7	52.9	99.4	10.8	16
10	a	Jabkangbro	13.1	8.2	25.9	55.1	102.3	25.4	17
10	b	Tshedangtse	2.2	10.5	57.5	27.1	97.3	112	8

Comp	Sub-Compartment		Area Distribution (ha)					BA (m ² /ha)	No. of Plots
	No.	Name	Non Forest Area	Protection	Inoperable	Production	Total		
1		Zhengtsangteng	33.2	10.2	115.05	575	733.45	21.5	163
2		Layphrangma	42.3	11.5	94.3	268.1	416.2	20.6	73
3		Sangtangsa	21	10.3	73.3	306.4	411	21.1	80
4		Chunakpo	28.4	11	217.5	249.5	506.4	18.0	67
5		Pusa top	20.4	9	103.7	163.9	297	24.1	46
6		Meserteng	63.7	8.7	176.9	144.5	393.8	17.5	45
7		Tsebchen-Mangdi	31.7	2.9	43.4	112.4	190.4	35.6	36
8		Mirkhe-Throngbro	33.4	21.8	198.7	235.7	489.6	21.5	68
9		Benangtse	96.8	42.2	175	383.8	697.8	18.0	119
10		Jabkangbro	15.3	18.7	83.4	82.2	199.6	54.0	25
Total			386.2	146.3	1281.25	2521.5	4335.25	22.1	722

Stand Data of Forest Management Area: Sakteng

Comp No.	Sub-Compartment No.	Name	Production area (ha)	Basal Area (m2/ha)	Volume (m3/ha)	Tot. Volume (m3)	V conifer (%)
1	a	Dombrok	56.4	19.5	160.8	9069.1	88.0
1	b	Zhengtsangteng	75.4	29.1	373.8	28184.5	84.0
1	c	Kenperi	78.0	15.0	144.8	11294.4	93.0
1	d	Lhabrateng	94.4	21.6	173.0	16331.2	86.0
1	e	Dakpashisa	79.3	24.0	389.7	30903.2	94.0
1	f	Donglumarpo	99.0	19.0	94.5	9355.5	28.0
1	g	Goigoberi	26.8	19.2	163.9	4392.5	58.0
1	h	Jabgoenpa	65.7	23.7	141.0	9263.7	60.0
2	a	Layphrangma	89.5	16.7	132.7	11876.7	79.0
2	b	Tsherzom	69.9	23.4	420.4	29386.0	85.0
2	c	Balung	63.1	22.7	419.1	26445.2	63.0
2	d	Brakshaktang	45.6	21.2	103.7	4728.7	18.0
3	a	Sangtangsa	78.8	18.8	124.6	9818.5	71.0
3	b	Zomla	90.2	14.6	112.4	10138.5	60.0
3	c	Borangtse 1	88.3	21.2	453.2	40017.6	90.0
3	d	Borangtse 2	49.1	36.6	496.1	24358.5	19.0
4	a	Chunakpo	61.9	15.8	144.2	8926.0	70.0
4	b	Domsagang	23.5	14.3	146.8	3449.8	83.0
4	c	Rangnga	39.8	18.5	125.3	4986.9	66.0
4	d	Chabchuna	47.8	26.0	283.2	13537.0	45.0
4	e	Naglagang	76.5	15.5	123.0	9409.5	60.0
5	c	Zhemshatsey	45.0	29.7	358.1	16114.5	76.0
5	d	Gothorong	68.8	24.9	396.0	27244.8	84.0
5	e	Nuglu	50.1	18.1	314.3	15746.4	90.0
6	a	Rinakpo	31.4	21.3	408.3	12820.6	95.0
6	b	Nahizhong	55.1	17.1	140.6	7747.1	75.0
6	c	Saleyrong	29.3	16.0	122.6	3592.2	62.0
6	d	Meserteng	28.7	15.4	230.3	6609.6	80.0
7	a	Tsebchen-Mangdi	61.5	27.5	329.3	20252.0	3.0
7	b	Bethangtse	50.9	45.4	1366.9	69575.2	11.0
8	a	Mirkhe	53.6	22.8	205.2	10998.7	2.0
8	b	Broksar	57.7	20.1	703.8	40609.3	43.0
8	c	Yardam	41.1	29.5	419.0	17220.9	62.0
8	d	Laitse	21.4	16.7	121.1	2591.5	60.0
8	e	Throngbro	61.9	18.1	227.9	14107.0	4.0
9	a	Benangtse	69.9	17.9	285.4	19949.5	78.0
9	b	Tabkangbro	60.9	18.0	134.5	8191.1	74.0
9	c	Zampakhajuk	35.2	20.5	271.1	9542.7	81.0
9	d	Bainangtse	77.1	20.3	339.6	26183.2	80.0
9	e	Namthengtse	39.6	13.8	84.1	3330.4	16.0
9	f	Khenphutse	48.2	24.1	422.5	20364.5	73.0
9	g	Prabo	52.9	10.8	111.2	5882.5	5.0
10	a	Jabkangbro	55.1	25.4	230.9	12722.6	56.0
10	b	Tshedangtse	27.1	112.0	2345.4	63560.3	83.0

Compartment	Production area (ha)	Basal Area (m2/ha)	Volume (m3/ha)	Tot. Volume (m3)	V conifer (%)	
1	Zhengtsangteng	575.0	21.5	206.6	118794.2	73.7
2	Layphrangma	268.1	20.6	270.2	72436.5	66.4
3	Sangtangsa	306.4	21.1	275.2	84333.0	64.9
4	Chunakpo	249.5	18.0	161.6	40309.2	62.7
5	Pusa top	163.9	24.1	360.6	59105.7	83.6
6	Meserteng	144.5	17.5	212.9	30769.5	77.7
7	Tsebchen-Mangdi	112.4	35.6	799.2	89827.2	6.6
8	Mirkhe-Throngbro	235.7	21.5	362.9	85527.4	28.3
9	Benangtse	383.8	18.0	243.5	93443.7	61.0
10	Jabkangbro	82.2	54.0	928.0	76282.9	64.9
Total	2521.5	22.1	297.8	750829.4	62.2	

Forest Type Distribution in Forest Management Area of: Sakteng

Comp	Sub-Compartment		Prod. Area (ha)	Forest Type Distribution (in ha)								
	No.	Name		Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total
1	a	Dombrok	56.4		46.2		10.2					
1	b	Zhengtsangteng	75.4		60.3		15.1					
1	c	Kenperi	78		67.1		10.9					
1	d	Lhabrateng	94.4		83.1		12.3					16.0
1	e	Dakpashisa	79.3		79.3							4.0
1	f	Donglumarpo	99		4.0		75.2		11.9	7.9		4.0
1	g	Goigoberi	26.8		15.5		2.1		8.8			
1	h	Jabgoenpa	65.7	3.9	21.7		25.6		11.2	3.9		3.9
2	a	Layphrangma	89.5		81.4		8.1					8.1
2	b	Tsherzom	69.9		58.0		11.9					4.2
2	c	Balung	63.1	3.8	6.9		42.3				10.7	
2	d	Brakshaktang	45.6				3.2		9.1	33.3		9.1
3	a	Sangtangsa	78.8		59.9		18.9					3.9
3	b	Zomla	90.2		70.4		19.8					11.7
3	c	Borantse 1	88.3		88.3							
3	d	Borantse 2	49.1		10.3		38.8					
4	a	Chunakpo	61.9		61.9							
4	b	Domsagang	23.5		19.5		4.0					
4	c	Rangnga	39.8		32.6		7.2					
4	d	Chabchuna	47.8		18.2		29.6					
4	e	Naglagang	76.5		19.1		57.4					
5	c	Zhemshatsey	45		37.4		7.7					3.6
5	d	Gothorong	68.8		57.1		11.7					
5	e	Nuglu	50.1		50.1							
6	a	Rinakpo	31.4		31.4							
6	b	Nahizhong	55.1		55.1							
6	c	Saleyrong	29.3		22.9				6.4			
6	d	Meserteng	28.7		20.1				8.6			
7	a	Tsebchen-Mangdi	61.5						48.6	12.9		6.8
7	b	Bethangtse	50.9							50.9		
8	a	Mirkhe	53.6						33.8	20.4		13.4
8	b	Broksar	57.7				16.7		10.4	30.6		3.5
8	c	Yardam	41.1							41.1		
8	d	Laitse	21.4		21.4							
8	e	Throngbro	61.9							61.9		7.4
9	a	Benangtse	69.9	3.5	14.0		3.5			48.9		10.5
9	b	Tabkangbro	60.9		60.9							
9	c	Zampakhajuk	35.2				13.4	5.3		16.2		2.8
9	d	Bainangtse	77.1		10.0					67.1		10.0
9	e	Namthengtse	39.6				7.5		5.1	27.3		19.8
9	f	Khenphutse	48.2							48.2		3.4
9	g	Prabo	52.9				3.2			49.7		6.9
10	a	Jabkangbro	55.1	22.6				9.9		22.6		16.0
10	b	Tshedangtse	27.1							27.1		

Compartment	Prod. Area (ha)	Forest Type Distribution (in ha)									
		Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total	
1	Zhengtsangteng	575.0	1%	66%		26%			6%	2%	100%
2	Layphrangma	268.1	1%	55%		24%			3%	16%	100%
3	Sangtangsa	306.4		75%		25%					100%
4	Chunakpo	249.5		61%		39%					100%
5	Pusa top	163.9		88%		12%					100%
6	Meserteng	144.5		90%				10%			100%
7	Tsebchen-Mangdi	112.4						43%	57%		100%
8	Mirkhe-Throngbro	235.7		9%		7%		19%	65%		100%
9	Benangtse	383.8	1%	22%		7%	1%	1%	67%		100%
10	Jabkangbro	82.2	27%				12%		60%		100%
Total	2521.5	1%	51%		18%	1%		6%	23%	100%	

Canopy Closure and Condition of Forest Management Area of:

Sakteng

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Canopy closure (ha)					Condition (ha)			
			dense	closed	open	unstocked	Total	good	average	poor	Total
1	a Dombrok	56.4		46.2	10.2		56.4		48.5	7.9	56.4
1	b Zhengtsangteng	75.4		64.1	3.8		67.9	64.1	11.3		75.4
1	c Kenperi	78		67.1	7.8	3.9	78.8	7.8	70.2		78.0
1	d Lhabrateng	94.4		67.0	23.6	3.8	94.4	12.3	83.1		95.3
1	e Dakpashisa	79.3		23.0	56.3		79.3		79.3		79.3
1	f Donglumarpo	99		27.7	67.3	4.0	99.0		99.0		99.0
1	g Goigoberi	26.8			18.0	8.8	26.8		26.8		26.8
1	h Jabgoenpa	65.7		25.6	18.4	21.7	65.7		65.7		65.7
2	a Layphrangma	89.5		49.2	32.2	8.1	89.5	8.1	81.4		89.5
2	b Tsherzom	69.9		69.9			69.9		69.9		69.9
2	c Balung	63.1		63.1			63.1		63.1		63.1
2	d Brakshaktang	45.6	3.2	18.2	12.3	12.3	46.1		45.6		45.6
3	a Sangtangsa	78.8		55.9	11.0	11.0	78.0		70.9	7.9	78.8
3	b Zomla	90.2		58.6	27.1	3.6	89.3		90.2		90.2
3	c Borangtse 1	88.3		88.3			88.3		88.3		88.3
3	d Borangtse 2	49.1	10.3	31.4	6.9		48.6		38.8	10.3	49.1
4	a Chunakpo	61.9		25.4	36.5		61.9	40.2	21.7		61.9
4	b Domsagang	23.5		4.0	11.8	7.8	23.5	4.0	11.8	7.8	23.5
4	c Rangnga	39.8		10.7	25.5	3.6	39.8	21.9	14.3	3.6	39.8
4	d Chabchuna	47.8		25.8	22.0		47.8		36.8	11.0	47.8
4	e Naglagang	76.5		11.5	53.6	11.5	76.5		68.9	7.7	76.5
5	c Zhemshatsey	45		14.9	30.2		45.0	3.6	11.3	30.2	45.0
5	d Gothorong	68.8		22.7	42.0	4.1	68.8	7.6	26.8	34.4	68.8
5	e Nuglu	50.1		40.6	9.5		50.1	34.6	15.5		50.1
6	a Rinakpo	31.4		13.8	17.6		31.4	3.5	6.9	21.0	31.4
6	b Nahizhong	55.1			41.9	13.2	55.1		48.5	6.6	55.1
6	c Saleyrong	29.3		3.2	26.1		29.3		29.3		29.3
6	d Meserteng	28.7		8.6	14.4	5.7	28.7	2.9	20.1	5.7	28.7
7	a Tsebchen-Mangdi	61.5	28.9	12.9	19.7		61.5	28.9	32.6		61.5
7	b Bethangtse	50.9		27.0	23.9		50.9	23.9	27.0		50.9
8	a Mirkhe	53.6	16.6	16.6	13.4	7.0	53.6	10.2	37.0	7.0	54.1
8	b Broksar	57.7	6.9	20.2	10.4	20.2	57.7	20.2	23.7	13.8	57.7
8	c Yardam	41.1		17.3	23.8		41.1	7.0	27.5	7.0	41.5
8	d Laitse	21.4		7.1	3.6		10.7		14.3	7.1	21.4
8	e Throngbro	61.9	3.7	14.9	29.1	14.9	62.5		50.8	11.1	61.9
9	a Benangtse	69.9	3.5	38.4	17.5	10.5	69.9	17.5	41.9	10.5	69.9
9	b Tabkangbro	60.9	28.6	11.0	17.7	3.7	60.9	21.3	32.3	7.3	60.9
9	c Zampakhajuk	35.2	13.4	8.1	10.9	2.8	35.2	8.1	27.1		35.2
9	d Bainangtse	77.1	30.1	17.0	23.1	6.9	77.1	33.2	33.2	10.0	76.3
9	e Namthengtse	39.6	5.1	5.1	27.3	2.4	40.0	2.4	32.1	5.1	39.6
9	f Khenphutse	48.2	3.4	20.7	24.1		48.2	14.0	34.2		48.2
9	g Prabo	52.9	6.9	20.1	26.5		53.4	6.9	42.8	3.2	52.9
10	a Jabkangbro	55.1	16.0	9.9	22.6	6.6	55.1	19.3	29.2	6.6	55.1
10	b Tshedangtse	27.1		17.1	10.3		27.4	23.8	3.5		27.4

Compartment	Prod. Area (ha)	Canopy closure (ha)					Condition (ha)				
		dense	closed	open	unstocked	Total	good	average	poor	Total	
1	Zhengtsangteng	575.0		56%	36%	7%	99%	15%	84%	1%	100%
2	Layphrangma	268.1	1%	75%	17%	8%	100%	3%	97%		100%
3	Sangtangsa	306.4	3%	76%	15%	5%	99%		94%	6%	100%
4	Chunakpo	249.5		31%	60%	9%	100%	27%	61%	12%	100%
5	Pusa top	163.9		48%	50%	3%	100%	28%	33%	39%	100%
6	Meserteng	144.5		18%	69%	13%	100%	4%	73%	23%	100%
7	Tsebchen-Mangdi	112.4	26%	35%	39%		100%	47%	53%		100%
8	Mirkhe-Throngbro	235.7	12%	32%	34%	18%	96%	16%	65%	20%	100%
9	Benangtse	383.8	24%	31%	38%	7%	100%	27%	63%	9%	100%
10	Jabkangbro	82.2	19%	33%	40%	8%	100%	52%	40%	8%	100%
Total	2521.5	7%	48%	37%	8%	99%	18%	73%	10%	100%	

Age Distribution and Stand Types in Forest Management Area of: Sakteng

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Age distribution					Stand type distribution			
			young	immature	mature	overmature	Total	plantation	natural	coopice	Total
1	a Dombrok	56.4			51.3	5.1	56.4		56.4		56.4
1	b Zhengtsangteng	75.4			64.1	11.3	75.4		75.4		75.4
1	c Kenperi	78			59.3	10.9	70.2		78.0		78.0
1	d Lhabrateng	94.4	16.0	3.8	70.8	3.8	94.4		94.4		94.4
1	e Dakpashisa	79.3	4.0	4.0	71.4		79.3		79.3		79.3
1	f Donglumarpo	99	4.0	27.7	59.4	7.9	99.0		99.0		99.0
1	g Goigoberi	26.8			22.2	4.6	26.8		26.8		26.8
1	h Jabgoenpa	65.7	3.9	21.7	36.8	3.9	66.4		65.7		65.7
2	a Layphrangma	89.5	8.1		81.4		89.5		89.5		89.5
2	b Tsherzom	69.9	4.2	4.2	11.9	50.3	70.6		69.9		69.9
2	c Balung	63.1			45.4	17.7	63.1		63.1		63.1
2	d Brakshaktang	45.6	9.1	12.3	21.4	3.2	46.1		45.6		45.6
3	a Sangtangsa	78.8	3.9	3.9	67.8	3.9	79.6		78.8		78.8
3	b Zomla	90.2	11.7	8.1	55.0	15.3	90.2		90.2		90.2
3	c Borangtse 1	88.3			80.4	7.9	88.3		88.3		88.3
3	d Borangtse 2	49.1		21.1	28.0		49.1		49.1		49.1
4	a Chunakpo	61.9		3.7	58.2		61.9		61.9		61.9
4	b Domsagang	23.5		7.8	15.7		23.5		23.5		23.5
4	c Rangnga	39.8		3.6	36.2		39.8		39.8		39.8
4	d Chabchuna	47.8		3.8	44.0		47.8		47.8		47.8
4	e Naglagang	76.5		7.7	68.9		76.5		76.5		76.5
5	c Zhemshatsey	45	3.6	11.3	30.2		45.0		45.0		45.0
5	d Gothorong	68.8		30.3	38.5		68.8		68.8		68.8
5	e Nuglu	50.1		12.5	37.6		50.1		50.1		50.1
6	a Rinakpo	31.4			24.5	6.9	31.4		31.4		31.4
6	b Nahizhong	55.1			55.1		55.1		55.1		55.1
6	c Saleyrong	29.3			29.3		29.3		29.3		29.3
6	d Meserteng	28.7		2.9	25.8		28.7		28.7		28.7
7	a Tsebchen-Mangdi	61.5	6.8	28.9	25.8		61.5		61.5		61.5
7	b Bethangtse	50.9		3.1	41.7	6.1	50.9		50.9		50.9
8	a Mirkhe	53.6	13.4	13.4	20.4	7.0	54.1		53.6		53.6
8	b Broksar	57.7	3.5	13.8	34.0	6.9	58.3		57.7		57.7
8	c Yardam	41.1		7.0	34.1		41.1		41.1		41.1
8	d Laitse	21.4		3.6	14.3	3.6	21.6		21.4		21.4
8	e Throngbro	61.9	7.4	29.1	18.0	7.4	61.9		61.9		61.9
9	a Benangtse	69.9	10.5	24.5	31.5	3.5	69.9		69.9		69.9
9	b Tabkangbro	60.9		3.7	43.2	14.6	61.5		60.9		60.9
9	c Zampakhajuk	35.2	2.8	16.2	10.9	5.3	35.2		35.2		35.2
9	d Bainangtse	77.1	10.0	10.0	47.0	10.0	77.1		77.1		77.1
9	e Namthengtse	39.6	19.8	15.0	5.1		40.0		39.6		39.6
9	f Khenphutse	48.2	3.4	10.1	34.2		47.7		48.2		48.2
9	g Prabo	52.9	6.9	6.9	33.3	6.9	54.0		52.9		52.9
10	a Jabkangbro	55.1	16.0	29.2	6.6	3.3	55.1		55.1		55.1
10	b Tshedangtse	27.1		3.5	23.8		27.4		27.1		27.1

Compartment	Prod. Area (ha)	Age distribution					Stand type distribution			
		young	immature	mature	overmature	Total	plantation	natural	coopice	Total
1 Zhengtsangteng	575.0	5%	10%	76%	8%	99%		100%		100%
2 Layphrangma	268.1	8%	6%	60%	27%	100%		100%		100%
3 Sangtangsa	306.4	5%	11%	75%	9%	100%		100%		100%
4 Chunakpo	249.5		11%	89%		100%		100%		100%
5 Pusa top	163.9	2%	33%	65%		100%		100%		100%
6 Meserteng	144.5		2%	93%	5%	100%		100%		100%
7 Tsebchen-Mangdi	112.4	6%	28%	60%	5%	100%		100%		100%
8 Mirkhe-Throngbro	235.7	10%	28%	51%	11%	101%		100%		100%
9 Benangtse	383.8	14%	23%	54%	10%	100%		100%		100%
10 Jabkangbro	82.2	19%	40%	37%	4%	100%		100%		100%
Total	2521.5	7%	16%	68%	9%	100%		100%		100%

Forest Management Area of:

Sakteng

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Slope (in ha)			Erosiveness (in ha)			Soil Cover (in ha)		
			gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
1	a Dombrok	56.4		41.2			48.5	7.9	7.9	51.3	5.1
1	b Zhengtsangteng	75.4		75.4			75.4			75.4	
1	c Kenperi	78		55.4	22.6	7.8	59.3	10.9		78.0	
1	d Lhabrateng	94.4	7.6	86.8			94.4			94.4	
1	e Dakpashisa	79.3	30.1	49.2		4.0	75.3			75.3	4.0
1	f Donglumarpo	99		75.2	23.8		95.0	4.0		95.0	4.0
1	g Goigoberi	26.8	13.4	13.4		4.6	22.2			26.8	
1	h Jabgoenpa	65.7	21.7	36.8	7.2		65.7			65.7	
2	a Layphrangma	89.5	4.5	81.4	4.5		85.0	4.5		85.0	4.5
2	b Tsherzom	69.9	4.2	74.1	15.4	4.2	65.7			69.9	
2	c Balung	63.1	3.8	56.2	3.8		59.3	3.8		63.1	
2	d Brakshaktang	45.6		30.6	15.0		45.6			45.6	
3	a Sangtangsa	78.8	7.9	70.9			78.8			78.8	
3	b Zomla	90.2	15.3	55.0	19.8		86.6	3.6		86.6	3.6
3	c Borangtse 1	88.3	12.4	68.0	7.9	4.4	83.9			75.9	12.4
3	d Borangtse 2	49.1	6.9	24.6	17.7	14.2	24.6	10.3		34.9	14.2
4	a Chunakpo	61.9		11.1	50.8	40.2	14.9	7.4		58.2	3.7
4	b Domsagang	23.5	4.0	7.8	11.8	7.8	7.8	7.8	7.8	15.7	
4	c Rangnga	39.8	3.6	3.6	32.6	21.9	17.9			39.8	
4	d Chabchuna	47.8	3.8	22.0	22.0	3.8	25.8	18.2		29.6	18.2
4	e Naglagang	76.5	11.5	26.8	38.3	49.7	26.8			76.5	
5	c Zhemshatsey	45	3.6	3.6	37.4	3.6	11.3	30.2		3.6	41.4
5	d Gothorong	68.8	11.7	34.4	2.1	7.6	38.5	26.8		30.3	38.5
5	e Nuglu	50.1	25.1	25.1		44.1	6.5		31.6	19.0	
6	a Rinakpo	31.4		13.8	17.6		13.8	17.6	3.5	10.4	17.6
6	b Nahizhong	55.1		35.8	19.3		48.5	6.6		35.8	19.3
6	c Saleyrong	29.3	6.4	22.9			29.3			29.3	
6	d Meserteng	28.7	11.5	17.2		2.9	17.2	2.9		23.0	5.7
7	a Tsebchen-Mangdi	61.5	25.8	25.8	9.8		19.7	41.8		16.0	45.5
7	b Bethangtse	50.9	6.1	44.8		36.1	14.8		33.1	14.8	3.1
8	a Mirkhe	53.6	20.4	16.6	16.6	13.4	16.6	16.6	10.2	33.8	10.2
8	b Broksar	57.7	3.5	34.0	20.2	16.7	30.6	10.4	16.7	27.1	13.8
8	c Yardam	41.1	3.3	17.3	20.6	17.3	17.3	7.0	7.0	17.3	17.3
8	d Laitse	21.4	3.6	7.1	10.7		14.3	7.1		14.3	7.1
8	e Throngbro	61.9	3.7	40.2	18.0	18.0	36.5	7.4	7.4	43.9	11.1
9	a Benangtse	69.9	3.5	45.4	21.0	17.5	21.0	17.5	14.0	45.4	10.5
9	b Tabkangbro	60.9	11.0	32.3	17.7	14.6	28.6	17.7	7.3	46.3	7.3
9	c Zampakhajuk	35.2	10.9	10.9	16.2	13.4	10.9	10.9	8.1	19.0	8.1
9	d Bainangtse	77.1	17.0	30.1	30.1	17.0	43.9	17.0	6.9	57.1	13.1
9	e Namthengtse	39.6	5.1	19.8	15.0	15.0	17.4	7.5	7.5	24.9	7.5
9	f Khenphutse	48.2	3.4	20.7	24.1	20.7	27.5		20.7	27.5	
9	g Prabo	52.9	6.9	20.1	26.5	6.9	33.3	13.2	6.9	33.3	13.2
10	a Jabkangbro	55.1	16.0	6.6	32.5	6.6	35.8	13.2		48.5	6.6
10	b Tshedangtse	27.1	6.8	13.6	6.8	23.8	3.5			23.8	3.5

Compartment	Prod. Area (ha)	Slope (in ha)			Erosiveness (in ha)			Soil Cover (in ha)		
		gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
1 Zhengtsangteng	575.0	13%	75%	9%	3%	93%	4%	1%	98%	2%
2 Layphrangma	268.1	5%	90%	14%	2%	95%	3%		98%	2%
3 Sangtangsa	306.4	14%	71%	15%	6%	89%	5%		90%	10%
4 Chunakpo	249.5	9%	29%	62%	49%	37%	13%	3%	88%	9%
5 Pusa top	163.9	25%	38%	24%	34%	34%	35%	19%	32%	49%
6 Meserteng	144.5	12%	62%	26%	2%	75%	19%	2%	68%	29%
7 Tsebchen-Mangdi	112.4	28%	63%	9%	32%	31%	37%	29%	27%	43%
8 Mirkhe-Throngbro	235.7	15%	49%	36%	28%	49%	21%	18%	58%	25%
9 Benangtse	383.8	15%	47%	39%	27%	48%	22%	19%	66%	16%
10 Jabkangbro	82.2	28%	25%	48%	37%	48%	16%		88%	12%
Total	2521.5	14%	60%	26%	18%	67%	14%	8%	78%	15%

Distribution of Management Options for Forest Management Area of: **Sakteng**

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Management Option (in ha)					
			No activity	Improvement	Timber	Firewood	Silvopast.	Shokshing
1	a Dombrok	56.4	0.0	0.0	20.5	35.9	0.0	0.0
1	b Zhengtsangteng	75.4	0.0	0.0	75.4	0.0	0.0	0.0
1	c Kenperi	78	0.0	3.7	66.8	7.4	0.0	0.0
1	d Lhabrateng	94.4	0.0	0.0	82.6	15.7	0.0	0.0
1	e Dakpashisa	79.3	0.0	0.0	30.2	30.2	0.0	0.0
1	f Donglumarpo	99	0.0	0.0	0.0	83.2	0.0	0.0
1	g Goigoberi	26.8	0.0	0.0	0.0	20.1	0.0	0.0
1	h Jabgoenpa	65.7	0.0	0.0	0.0	65.8	0.0	0.0
2	a Layphrangma	89.5	0.0	0.0	40.7	28.5	0.0	0.0
2	b Tsherzom	69.9	0.0	0.0	50.5	0.0	0.0	0.0
2	c Balung	63.1	0.0	21.0	24.5	0.0	0.0	0.0
2	d Brakshaktang	45.6	0.0	0.0	0.0	39.5	0.0	0.0
3	a Sangtangsa	78.8	0.0	0.0	0.0	63.8	0.0	0.0
3	b Zomla	90.2	0.0	0.0	35.3	43.1	0.0	0.0
3	c Borangtse 1	88.3	0.0	0.0	68.2	20.1	0.0	0.0
3	d Borangtse 2	49.1	0.0	10.5	0.0	38.5	0.0	0.0
4	a Chunakpo	61.9	0.0	10.9	3.6	47.4	0.0	0.0
4	b Domsagang	23.5	0.0	7.8	3.9	3.9	0.0	0.0
4	c Rangnga	39.8	0.0	3.6	0.0	7.2	0.0	0.0
4	d Chabchuna	47.8	0.0	40.5	0.0	7.4	0.0	0.0
4	e Naglagang	76.5	0.0	22.9	0.0	42.1	0.0	0.0
5	c Zhemshatsey	45	0.0	18.8	0.0	26.3	0.0	0.0
5	d Gothorong	68.8	0.0	15.3	7.6	42.0	0.0	0.0
5	e Nuglu	50.1	0.0	9.4	3.1	37.6	0.0	0.0
6	a Rinakpo	31.4	0.0	20.9	0.0	10.5	0.0	0.0
6	b Nahizhong	55.1	0.0	9.7	45.4	0.0	0.0	0.0
6	c Saleyrong	29.3	0.0	0.0	13.0	16.3	0.0	0.0
6	d Meserteng	28.7	0.0	17.2	11.5	0.0	0.0	0.0
7	a Tsebchen-Mangdi	61.5	0.0	32.4	0.0	25.9	0.0	0.0
7	b Bethangtse	50.9	0.0	24.0	27.0	0.0	0.0	0.0
8	a Mirkhe	53.6	0.0	26.7	0.0	16.7	0.0	0.0
8	b Broksar	57.7	0.0	13.6	23.8	0.0	0.0	0.0
8	c Yardam	41.1	0.0	3.4	24.0	3.4	0.0	0.0
8	d Laitse	21.4	0.0	3.6	3.6	0.0	0.0	0.0
8	e Throngbro	61.9	0.0	21.8	0.0	10.9	0.0	0.0
9	a Benangtse	69.9	0.0	7.0	35.0	10.5	0.0	0.0
9	b Tabkangbro	60.9	0.0	3.6	35.8	0.0	0.0	0.0
9	c Zampakhajuk	35.2	0.0	2.7	10.8	18.9	0.0	0.0
9	d Bainangtse	77.1	0.0	3.4	13.4	26.8	0.0	0.0
9	e Namthengtse	39.6	0.0	7.4	0.0	0.0	0.0	0.0
9	f Khenphutse	48.2	0.0	0.0	20.6	20.6	0.0	0.0
9	g Prabo	52.9	0.0	0.0	0.0	33.0	0.0	0.0
10	a Jabkangbro	55.1	0.0	0.0	45.4	0.0	0.0	0.0
10	b Tshedangtse	27.1	0.0	0.0	16.9	10.2	0.0	0.0

Compartment	Prod. Area (ha)	Management Option (in ha)					
		No activity	Improvement	Timber	Firewood	Silvopast.	Shokshing
1 Zhengtsangteng	575.0	0.0	3.7	275.5	258.3	0.0	0.0
2 Layphrangma	268.1	0.0	21.0	115.7	68.0	0.0	0.0
3 Sangtangsa	306.4	0.0	10.5	103.5	165.5	0.0	0.0
4 Chunakpo	249.5	0.0	85.7	7.5	108.0	0.0	0.0
5 Pusa top	163.9	0.0	43.5	10.7	105.9	0.0	0.0
6 Meserteng	144.5	0.0	47.8	69.9	26.8	0.0	0.0
7 Tsebchen-Mangdi	112.4	0.0	56.4	27.0	25.9	0.0	0.0
8 Mirkhe-Throngbro	235.7	0.0	69.1	51.4	31.0	0.0	0.0
9 Benangtse	383.8	0.0	24.1	115.6	109.8	0.0	0.0
10 Jabkangbro	82.2	0.0	0.0	62.3	10.2	0.0	0.0
Total	2521.5	0.0	361.8	839.1	909.4	0.0	0.0

Production Potential of Forest Management Area:

Sakteng

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Volume (m3/ha)	harv. Volume (m3/ha)	Extract. Rate	Timber (Total Volume m3)				Firewood (Total Volume m3)			
						Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1	a Dombrok	56.4	160.8	8448.0	93.2%	1224	2347	1005	25	1514	308	1399	626
1	b Zhengtsangteng	75.4	373.8	18729.0	66.5%	8569	2878	1343	835	4964	110	0	30
1	c Kenperi	78.0	144.8	10568.0	93.6%	440	3943	658	739	3042	142	658	946
1	d Lhabrateng	94.4	173.0	15447.0	94.6%	854	2759	2430	3026	3582	368	732	1696
1	e Dakpashisa	79.3	389.7	24384.0	78.9%	18504	1874	959	1064	226	517	157	1083
1	f Donglumarmo	99.0	94.5	9218.0	98.5%	0	208	2678	3360	715	286	890	1081
1	g Gogoberi	26.8	163.9	2720.0	61.9%	313	124	110	30	508	495	473	667
1	h Jabgoempa	65.7	141.0	7867.0	84.9%	72	630	469	1111	1217	817	968	2583
2	a Layphrangma	89.5	132.7	11275.0	94.9%	1053	2809	1545	459	2625	297	981	1506
2	b Tsherzom	69.9	420.4	28002.0	95.3%	8421	1294	768	364	14116	988	1542	509
2	c Balung	63.1	419.1	25038.0	94.7%	1211	1398	1107	853	18844	1021	219	385
2	d Brakshaktang	45.6	103.7	4476.0	94.7%	0	128	333	2370	265	888	443	49
3	a Sangtangsa	78.8	124.6	9191.0	93.6%	370	1448	1688	904	1929	51	451	2350
3	b Zomla	90.2	112.4	11762.0	116.0%	1792	1861	1371	857	1792	1861	1371	857
3	c Borangtse 1	88.3	453.2	33555.0	83.9%	14806	1880	438	268	13473	1209	947	534
3	d Borangtse 2	49.1	496.1	19512.0	80.1%	4891	310	0	0	8430	1957	2182	1742
4	a Chunakpo	61.9	144.2	7324.0	82.1%	3046	1907	0	487	429	0	1455	0
4	b Domsagang	23.5	146.8	2817.0	81.7%	715	438	64	0	700	380	372	148
4	c Rangnga	39.8	125.3	4639.0	93.0%	722	1423	894	0	0	0	500	1100
4	d Chabchuna	47.8	283.2	12293.0	90.8%	1001	322	0	0	6968	987	1769	1246
4	e Naglagang	76.5	123.0	8488.0	90.2%	751	1078	1611	1445	1508	1147	749	199
5	c Zhemshatsey	45.0	358.1	13531.0	84.0%	3272	262	124	100	5522	1437	1459	1355
5	d Gothorong	68.8	396.0	23894.0	87.7%	4588	1230	613	0	13277	1018	1452	1716
5	e Nuglu	50.1	314.3	8405.0	53.4%	5402	1171	285	84	0	150	499	814
6	a Rinakpo	31.4	408.3	11212.0	87.5%	2578	0	0	0	7051	526	370	687
6	b Nahizhong	55.1	140.6	6526.0	84.2%	959	2303	1085	0	1090	310	779	0
6	c Saleyrong	29.3	122.6	2916.0	81.2%	1094	411	660	283	0	0	468	0
6	d Meserteng	28.7	230.3	6138.0	92.9%	2384	50	40	0	2463	331	331	539
7	a Tsebchen-Mangdi	61.5	329.3	11260.0	55.6%	0	324	0	0	6679	3864	393	0
7	b Bethangtse	50.9	1366.9	44822.0	64.4%	12522	0	0	0	30633	1188	321	158
8	a Mirkhe	53.6	205.2	5097.0	46.3%	433	300	64	0	3164	917	219	0
8	b Broksar	57.7	703.8	17011.0	41.9%	7347	1173	0	0	7575	857	33	26
8	c Yardam	41.1	419.0	12368.0	71.8%	5266	196	0	0	5723	839	316	28
8	d Laitse	21.4	121.1	1131.0	43.6%	0	467	0	0	350	314	0	0
8	e Throngbro	61.9	227.9	6568.0	46.6%	0	198	38	0	4299	1631	402	0
9	a Benangtse	69.9	285.4	14771.0	74.0%	6249	782	347	177	5377	883	524	432
9	b Tabkangbro	60.9	134.5	4157.0	50.8%	0	1580	1084	335	0	321	534	303
9	c Zampakhajuk	35.2	271.1	2007.0	21.0%	213	547	367	77	155	365	261	22
9	d Bainangtse	77.1	339.6	21045.0	80.4%	9939	1562	1505	0	6118	924	883	114
9	e Namthengtse	39.6	84.1	1026.0	30.8%	0	195	52	0	46	479	231	23
9	f Khenphutse	48.2	422.5	10163.0	49.9%	5936	66	46	0	2610	889	616	0
9	g Prabo	52.9	111.2	4129.0	70.2%	600	167	31	0	1964	836	369	162
10	a Jabkangbro	55.1	230.9	4938.0	38.8%	1638	2040	0	0	719	541	0	0
10	b Tshedangtse	27.1	2345.4	36470.0	57.4%	24789	191	56	0	9476	1363	429	166

Total per Compartment													
Compartment	Prod. Area (ha)	Volume (m3/ha)	harv. Volume (m3/ha)	Extract. Rate	Timber (Total Volume m3)				Firewood (Total Volume m3)				
					Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm	
1 Zhengtsangteng	575.0	206.6	97381	82%	29976	14763	9652	10190	15768	3043	5277	8712	
2 Layphrangma	268.1	270.2	68791	95%	10685	5629	3753	4046	35850	3194	3185	2449	
3 Sangtangsa	306.4	275.2	74020	88%	21859	5499	3497	2029	25624	5078	4951	5483	
4 Chunakpo	249.5	161.6	35561	88%	6235	5168	2569	1932	9605	2514	4845	2693	
5 Pusa top	163.9	360.6	45830	78%	13262	2663	1022	184	18799	2605	3410	3885	
6 Meserteng	144.5	212.9	26792	87%	7015	2764	1785	283	10604	1167	1948	1226	
7 Tsebchen-Mangdi	112.4	799.2	56082	62%	12522	324	0	0	37312	5052	714	158	
8 Mirkhe-Throngbro	235.7	362.9	42175	49%	13046	2334	102	0	21111	4558	970	54	
9 Benangtse	383.8	243.5	57298	61%	22937	4899	3432	589	16270	4697	3418	1056	
10 Jabkangbro	82.2	928.0	41408	54%	26427	2231	56	0	10195	1904	429	166	
Total	2521.5	3820.7	545338.0	73%	163964	46274	25868	19253	201138	33812	29147	25882	

Production Potential of Forest Management Area: Sakteng

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	BA (m ² /ha)	BAextr. (m ² /ha)	Extract. Rate	Timber (N total)				Firewood (N total)			
						Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1	a Dombrok	56.4	19.5	20.4	104.4%	426	2244	2716	290	265	331	5537	8415
1	b Zhengsangteng	75.4	29.1	20.9	71.9%	1656	2673	4145	8955	568	126		426
1	c Kenperi	78.0	15.0	15.9	105.9%	161	3575	1815	6722	415	93	2420	13023
1	d Lhabrateng	94.4	21.6	22.1	102.3%	317	2686	6568	31151	527	312	2403	22251
1	e Dakpashisa	79.3	24.0	23.5	97.9%	2437	1809	2615	9829	72	473	462	16240
1	f Donglumarpo	99.0	19.0	19.1	100.7%		274	10649	49300	70	347	3227	13445
1	g Gogoberi	26.8	19.2	16.3	85.1%	55	121	273	253	128	634	1822	9363
1	h Jabgoenpa	65.7	23.7	21.9	92.3%	31	669	1488	12813	130	1155	3720	37612
2	a Layphrangma	89.5	16.7	17.4	104.5%	355	2897	4309	4144	420	423	3812	21179
2	b Tsherzom	69.9	23.4	30.4	129.9%	1325	1262	1899	3077	1874	1343	6013	7033
2	c Balung	63.1	22.7	28.1	123.9%	282	1853	3997	11897	2028	1008	714	4759
2	d Brakshaktang	45.6	21.2	20.8	98.2%		165	1239	34062	106	1064	1610	688
3	a Sangtangsa	78.8	18.8	18.6	98.7%	140	1361	4739	10191	305	78	1834	34396
3	b Zomla	90.2	14.6	15.3	104.6%	352	2024	4135	7986	225		5111	17302
3	c Borangtse 1	88.3	21.2	26.3	123.9%	2286	1707	1144	2270	1733	1569	2942	6811
3	d Borangtse 2	49.1	36.6	40.2	109.8%	779	278			1044	2585	9137	26174
4	a Chunakpo	61.9	15.8	13.3	84.2%	653	1672		4124	184		4454	
4	b Domsagang	23.5	14.3	12.1	84.7%	95	392	160		104	328	1436	2216
4	c Rangnga	39.8	18.5	16.1	87.2%	234	1224	2212					16388
4	d Chabchuna	47.8	26.0	20.1	77.2%	245	292			867	1301		18722
4	e Naglagang	76.5	15.5	15.2	98.0%	322	878	5609	16013	147	1274	2337	2164
5	c Zhemshatsey	45.0	29.7	27.7	93.2%	408	281	306	849	751	1486	5045	16986
5	d Gothorong	68.8	24.9	26.7	107.3%	552	911	1712		1448	1335	5603	24211
5	e Nuglu	50.1	18.1	14.5	80.4%	667	1019	766	709		195	1914	9925
6	a Rinakpo	31.4	21.3	26.7	125.5%	441				993	509	1421	8685
6	b Nahizhong	55.1	17.1	16.0	93.8%	371	2030	3040		387	204	3304	
6	c Saleyrong	29.3	16.0	19.6	122.7%	372	366	1855	2576		1987		
6	d Meserteng	28.7	15.4	18.8	121.8%	397	36	117		328	383	1404	7476
7	a Tsebchen-Mangdi	61.5	27.5	18.9	68.6%		365			1369	4104	1450	
7	b Bethangtse	50.9	45.4	40.9	90.1%	973				3720	1339	1343	2374
8	a Mirkhe	53.6	22.8	8.6	37.8%	141	363	273		488	1018	682	
8	b Broksar	57.7	20.1	14.6	72.7%	714	1204			738	949	138	384
8	c Yardam	41.1	29.5	18.6	63.0%	560	129			883	985	1256	388
8	d Laitse	21.4	16.7	6.5	39.2%		402			150	254		
8	e Throngbro	61.9	18.1	9.9	54.6%		273	148		664	1927	1483	
9	a Benangtse	69.9	17.9	15.1	84.4%	749	772	997	1978	577	1235	1994	6331
9	b Tabkangbro	60.9	18.0	9.1	50.5%		1551	2771	2836		343	1459	3241
9	c Zampakhajuk	35.2	20.5	8.2	40.0%	81	497	1102	918	62	373	992	306
9	d Bainangtse	77.1	20.3	18.3	90.1%	1011	1799	3961	2276	659	1102	2868	1517
9	e Namthengtse	39.6	13.8	4.3	30.9%		309	202		21	536	807	280
9	f Khenphutse	48.2	24.1	15.1	62.5%	644	43	140		456	1161	2523	1168
9	g Prabo	52.9	10.8	7.4	69.0%	113	152	135		330	732	1346	2244
10	a Jabkangbro	55.1	25.4	11.7	46.2%	601	1947			303	434		
10	b Tshedangtse	27.1	112.0	76.1	67.9%	3048	128	138		1408	1608	1655	2298

Compartment	Prod. Area (ha)	BA (m ² /ha)	BAextr. (m ² /ha)	Extract. Rate	Timber (N total)				Firewood (N total)			
					Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1 Zhengsangteng	575.0	21.5	20.3	95%	5083	14051	30269	119313	2175	3471	19591	120775
2 Layphrangma	268.1	20.6	23.9	116%	1962	6177	11444	53180	4428	3838	12149	33659
3 Sangtangsa	306.4	21.1	23.3	110%	3557	5370	10018	20447	3307	4232	19024	84683
4 Chunakpo	249.5	18.0	15.5	86%	1549	4458	7981	20137	1302	2903	8227	39490
5 Pusa top	163.9	24.1	23.3	96%	1627	2211	2784	1558	2199	3016	12562	51122
6 Meserteng	144.5	17.5	19.6	112%	1581	2432	5012	2576	1708	3083	6129	16161
7 Tsebchen-Mangdi	112.4	35.6	28.8	81%	973	365			5089	5443	2793	2374
8 Mirkhe-Throngbro	235.7	21.5	12.0	56%	1415	2371	421		2923	5133	3559	772
9 Benangtse	383.8	18.0	12.0	66%	2598	5123	9308	8008	2105	5482	11989	15087
10 Jabkangbro	82.2	54.0	33.0	61%	3649	2075	138		1711	2042	1655	2298
Total	2521.5	251.9	211.7	84%	23994	44633	77375	225219	26947	38643	97678	366421

Silvicultural Measures for Forest Management Area: Sakteng

Comp No.	Sub-Compartment No. Name	Production Area (ha)	Sivicultural Measures (in ha)			Sivicultural Measures (in % of area)		
			Planting	Thinning	Felling	Planting	Thinning	Felling
1	a Dombrok	56.4		36.1	20.3		64	36
1	b Zhengtsangteng	75.4		37.7	37.7		50	50
1	c Kenperi	78.0	3.9	67.1	7.8	5	86	10
1	d Lhabrateng	94.4		83.1	16.0		88	17
1	e Dakpashisa	79.3		30.1	30.1		38	38
1	f Donglumarpo	99.0		83.2			84	
1	g Goigoberi	26.8		13.4	6.7		50	25
1	h Jabgoenpa	65.7		61.8	3.9		94	6
2	a Layphrangma	89.5		40.3	28.6		45	32
2	b Tsherzom	69.9		19.6	30.8		28	44
2	c Balung	63.1	20.8	24.6		33	39	
2	d Brakshaktang	45.6		39.7			87	
3	a Sangtangsa	78.8		44.9	18.9		57	24
3	b Zomla	90.2		43.3	35.2		48	39
3	c Borangtse 1	88.3		20.3	68.0		23	77
3	d Borangtse 2	49.1	10.3	38.8		21	79	
4	a Chunakpo	61.9	11.1	47.0	3.7	18	76	6
4	b Domsagang	23.5	7.8	4.0	4.0	33	17	17
4	c Rangnga	39.8	3.6	7.2		9	18	
4	d Chabchuna	47.8	3.8	36.8	7.2	8	77	15
4	e Naglagang	76.5	23.0	30.6	11.5	30	40	15
5	c Zhemshatsey	45.0	18.9	22.5	3.6	42	50	8
5	d Gothorong	68.8	15.1	42.0	7.6	22	61	11
5	e Nuglu	50.1	9.5	37.6	3.0	19	75	6
6	a Rinakpo	31.4	21.0	10.4		67	33	
6	b Nahizhong	55.1	9.9	45.2		18	82	
6	c Saleyrong	29.3	16.4	12.9		56	44	
6	d Meserteng	28.7	17.2	11.5		60	40	
7	a Tsebchen-Mangdi	61.5		32.6	25.8		53	42
7	b Bethangtse	50.9		23.9	27.0		47	53
8	a Mirkhe	53.6	3.2	23.6	16.6	6	44	31
8	b Broksar	57.7	3.5	10.4	23.7	6	18	41
8	c Yardam	41.1	3.3	3.3	23.8	8	8	58
8	d Laitse	21.4		3.6	3.6		17	17
8	e Throngbro	61.9		21.7	11.1		35	18
9	a Benangtse	69.9	7.0	10.5	35.0	10	15	50
9	b Tabkangbro	60.9		3.7	35.9		6	59
9	c Zampakhajuk	35.2	2.8	19.0	10.9	8	54	31
9	d Bainangtse	77.1	3.1	13.1	27.0	4	17	35
9	e Namthengtse	39.6	7.5			19		
9	f Khenphutse	48.2		20.7	20.7		43	43
9	g Prabo	52.9			33.3			63
10	a Jabkangbro	55.1			45.2			82
10	b Tshedangtse	27.1		10.3	17.1		38	63

Compartment	Production Area (ha)	Sivicultural Measures (in ha)			Sivicultural Measures (in % of area)		
		Planting	Thinning	Felling	Planting	Thinning	Felling
1 Zhengtsangteng	575	3.9	412.4	122.6	72	21	
2 Layphrangma	268.1	20.8	124.1	59.4	46	22	
3 Sangtangsa	306.4	10.3	147.3	122.1	48	40	
4 Chunakpo	249.5	49.3	125.6	26.4	50	11	
5 Pusa top	163.9	43.6	102.0	14.2	62	9	
6 Meserteng	144.5	64.6	79.9		55		
7 Tsebchen-Mangdi	112.4		56.5	52.8		47	
8 Mirkhe-Throngbro	235.7	10.0	62.6	78.9	27	33	
9 Benangtse	383.8	20.4	67.0	162.8	17	42	
10 Jabkangbro	82.2		10.3	62.3		76	
Total	2521.5	222.8	1187.8	701.4	9	47	28

NWFP Occurrence in Forest Management Area of: Sakteng

Comp No.	Sub-Compartment No.	Name	Prod. Area (ha)	Firewood				Bamboo				Cane				Daphne			
				Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse	
				(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	a	Dombrok	56.4	38.4	68	18.0	32			2.8	5								
1	b	Zhengtsangteng	75.4																
1	c	Kenperi	78	18.7	24	59.3	76												
1	d	Lhabrateng	94.4			94.4	100												
1	e	Dakpashisa	79.3																
1	f	Donglumarpo	99	87.1	88	11.9	12												
1	g	Goigoberi	26.8						2.1	8							18.0	67	
1	h	Jabgoenpa	65.7	25.6	39	25.6	39		3.9	6	3.9	6	36.8	56					
2	a	Layphrangma	89.5	28.6	32	60.9	68												
2	b	Tsherzom	69.9			11.9	17	11.9	17	23.1	33						4.2	6	
2	c	Balung	63.1			42.3	67			13.9	22						42.3	67	
2	d	Brakshaktang	45.6	15.0	33	30.6	67								9.1	20	21.4	47	
3	a	Sangtangsa	78.8	18.9	24	59.9	76										3.9	5	
3	b	Zomla	90.2	43.3	48	27.1	30												
3	c	Borantse 1	88.3																
3	d	Borantse 2	49.1	14.2	29	34.9	71										6.9	14	
4	a	Chunakpo	61.9	14.9	24	47.0	76												
4	b	Domsagang	23.5	7.8	33	15.7	67												
4	c	Rangnga	39.8	17.9	45	17.9	45		3.6	9							7.2	18	
4	d	Chabchuna	47.8	47.8	100										7.2	15	3.8	8	
4	e	Naglagang	76.5	23.0	30	57.4	75								3.8	5	15.3	20	
5	c	Zhemshatsey	45	14.9	33	33.8	75												
5	d	Gothorong	68.8	15.1	22	57.1	83												
5	e	Nuglu	50.1	37.6	75	9.5	19	6.5	13	6.5	13				3.0	6	9.5	19	
6	a	Rinakpo	31.4	10.4	33	24.5	78												
6	b	Nahizhong	55.1	6.6	12	55.1	100		32.5	59									
6	c	Saleyrong	29.3	6.4	22	22.9	78			22.9	78								
6	d	Meserteng	28.7	11.5	40	14.4	50			17.2	60						2.9	10	
7	a	Tsebchen-Mangdi	61.5	41.8	68	19.7	32	16.0	26	25.8	42				32.6	53	28.9	47	
7	b	Bethangtse	50.9	3.1	6	47.8	94	20.9	41	27.0	53				47.8	94	3.1	6	
8	a	Mirkhe	53.6	16.6	31	37.0	69	7.0	13	7.0	13				26.8	50	13.4	25	
8	b	Broksar	57.7			54.2	94	13.8	24	37.5	65				27.1	47	30.6	53	
8	c	Yardam	41.1			37.8	92	30.8	75	7.0	17						30.8	75	
8	d	Laitse	21.4	3.6	17	10.7	50	10.7	50	10.7	50						3.6	17	
8	e	Throngbro	61.9	18.0	29	40.2	65	61.9	100						21.7	35	7.4	12	
9	a	Benangtse	69.9			48.9	70	14.0	20	21.0	30				7.0	10	35.0	50	
9	b	Tabkangbro	60.9			32.3	53	11.0	18										
9	c	Zampakhajuk	35.2			24.3	69	21.8	62	5.3	15				5.3	15	8.1	23	
9	d	Bainangtse	77.1	3.1	4	40.1	52	20.0	26	37.0	48						17.0	22	
9	e	Namthengtse	39.6	5.1	13	22.2	56	7.5	19	15.0	38				15.0	38	2.4	6	
9	f	Khenphutse	48.2	3.4	7	38.1	79	34.2	71	10.1	21				14.0	29	10.1	21	
9	g	Prabo	52.9	10.1	19	39.7	75			6.9	13				13.2	25	26.5	50	
10	a	Jabkangbro	55.1	3.3	6	51.8	94	35.8	65	13.2	24						48.5	88	
10	b	Tshedangtse	27.1	3.5	13	20.3	75	10.3	38	10.3	38				3.5	13	17.1	63	

Compartment	Prod. Area (ha)	Firewood				Bamboo				Cane				Daphne				
		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
1	Zhengtsangteng	575.0	169.8	30	209.2	36			8.9	2	3.9	1	36.8	6			18.0	3
2	Layphrangma	268.1	43.7	16	145.6	54	11.9	4	36.9	14					9.1	3	67.9	25
3	Sangtangsa	306.4	76.4	25	121.8	40											10.8	4
4	Chunakpo	249.5	111.3	45	138.1	55			3.6	1					11.0	4	26.3	11
5	Pusa top	163.9	67.6	41	100.4	61	6.5	4	6.5	4					3.0	2	9.5	6
6	Meserteng	144.5	34.9	24	116.8	81			72.6	50					2.9	2	5.7	4
7	Tsebchen-Mangdi	112.4	44.9	40	67.5	60	36.9	33	52.8	47					80.4	72	32.0	28
8	Mirkhe-Throngbro	235.7	38.2	16	180.0	76	124.2	53	62.2	26					75.6	32	85.9	36
9	Benangtse	383.8	21.7	6	245.5	64	108.6	28	95.3	25					54.5	14	99.0	26
10	Jabkangbro	82.2	6.8	8	72.1	88	46.1	56	23.5	29					3.5	4	65.6	80
Total		2521.5	615.2	24	1397.0	55	334.2	13	362.3	14	3.9	0	36.8	1	240.1	10	420.6	17

Current Side Uses within Forest Management Area: Sakteng

Comp No.	Sub-Compartment		Prod. Area (ha)	Grazing				Sokshing				Lopping			
	No.	Name		Intensive		Extensive		Intensive		Extensive		Intensive		Extensive	
				(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	a	Dombrok	56.4	4.6	8	33.3	59								
1	b	Zhengtsangteng	75.4			52.8	70								
1	c	Kenperi	78.0	14.8	19	44.5	57								
1	d	Lhabrateng	94.4	51.0	54	47.2	50								
1	e	Dakpashisa	79.3			79.3	100								
1	f	Donglumarpo	99.0	27.7	28	71.3	72								
1	g	Goigoberi	26.8			20.1	75								
1	h	Jabgoenpa	65.7	7.2	11	28.9	44								
2	a	Layphrangma	89.5	40.3	45	32.2	36								
2	b	Tsherzom	69.9			58.0	83								
2	c	Balung	63.1			52.4	83						3.5	6	
2	d	Brakshaktang	45.6	5.9	13	21.4	47								
3	a	Sangtangsa	78.8	41.0	52	37.8	48								
3	b	Zomla	90.2	43.3	48	11.7	13								
3	c	Borantse 1	88.3												
3	d	Borantse 2	49.1	28.0	57	21.1	43					3.5	7		
4	a	Chunakpo	61.9	50.8	82	11.1	18							61.9	100
4	b	Domsagang	23.5	7.8	33	15.7	67								
4	c	Rangnga	39.8	39.8	100									39.8	100
4	d	Chabchuna	47.8	11.0	23	44.0	92								
4	e	Naglagang	76.5	53.6	70	23.0	30							76.5	100
5	c	Zhemshatsey	45.0	11.3	25	37.4	83								
5	d	Gothorong	68.8	34.4	50	34.4	50								
5	e	Nuglu	50.1	22.0	44	9.5	19								
6	a	Rinakpo	31.4	17.6	56	13.8	44								
6	b	Nahizhong	55.1	48.5	88	6.6	12							55.1	100
6	c	Saleyrong	29.3	29.3	100									29.3	100
6	d	Meserteng	28.7	11.5	40	5.7	20							14.4	50
7	a	Tsebchen-Mangdi	61.5	28.9	47	25.8	42					12.9	21		
7	b	Bethantse	50.9	6.1	12	44.8	88					14.8	29	23.9	47
8	a	Mirkhe	53.6	26.8	50	26.8	50					26.8	50	23.6	44
8	b	Broksar	57.7	3.4	6	54.2	94					30.6	53	27.1	47
8	c	Yardam	41.1	7.0	17	17.3	42					10.3	25	7.0	17
8	d	Laitse	21.4	14.3	67										
8	e	Throngbro	61.9	32.8	53	29.1	47					11.1	18	18.0	29
9	a	Benangtse	69.9	35.0	50	14.0	20					17.5	25	3.5	5
9	b	Tabkangbro	60.9	11.0	18	17.7	29					7.3	12		
9	c	Zampakhajuk	35.2	13.4	38	5.3	15					2.7	8	8.1	23
9	d	Bainangtse	77.1	30.1	39									3.3	4
9	e	Namthengtse	39.6	12.3	31	19.8	50					9.9	25	17.4	44
9	f	Khenphutse	48.2	17.4	36	10.1	21					6.7	14	3.4	7
9	g	Prabo	52.9	10.1	19	36.5	69					16.4	31	26.5	50
10	a	Jabkangbro	55.1	16.0	29	39.1	71					25.9	47	3.3	6
10	b	Tshedangtse	27.1	10.3	38	10.3	38								

Compartment	Prod. Area (ha)	Grazing				Sokshing				Lopping					
		Intensive		Extensive		Intensive		Extensive		Intensive		Extensive			
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)		
1	Zhengtsangteng	575.0	105.3	18	377.3	66									
2	Layphrangma	268.1	46.2	17	164.0	61								3.5	1
3	Sangtangsa	306.4	112.3	37	70.7	23				3.5	1				
4	Chunakpo	249.5	162.9	65	93.8	38								178.2	71
5	Pusa top	163.9	67.7	41	81.3	50									
6	Meserteng	144.5	106.9	74	26.2	18								98.8	68
7	Tsebchen-Mangdi	112.4	35.0	31	70.6	63				27.7	25	23.9	21		
8	Mirkhe-Throngbro	235.7	84.3	36	127.4	54				78.8	33	75.6	32		
9	Benangtse	383.8	129.0	34	103.3	27				60.5	16	62.2	16		
10	Jabkangbro	82.2	26.3	32	49.4	60				25.9	32	3.3	4		
Total		2521.5	875.8	35	1164.0	46				196.4	8	445.5	18		

Calculation of AAC:

1. The average rotation period is calculated by multiplication of the proportion forest type * rotation period of forest type
2. The sustainable AAC is determined by dividing the total standing stock by the average rotation period
3. The silvicultural AAC is determined by dividing the production period by the planning period of 10 years
4. The AAC is fixed at the sustainable AAC or silvicultural AAC, whichever is lower!

Unit	Forest Type Distribution								
	Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total
Proportion	1%	51%	0%	18%	1%	0%	6%	23%	100%
Rotation period	130	140	130	120	90	90	130	120	131

AACsust. = standing volume/rotation period	5737 m3
	2.3 m3/ha
AACsilv. = prod. Potential/10 years	54534 m3
	22 m3/ha
AACfixed	5737 m3
	2.3 m3/ha
Prod. Potential/AAC =	95 years

Annexure 15: Compartment Register for Sakteng FMA

Sub-Compartment Record																																																																																																																																																
Geog	Sakteng	Comp.	C1Zhengtsangteng	Sub-Comp.	Dombrok	No.	1A																																																																																																																																									
Areas in ha																																																																																																																																																
Non Forest Area	0.6	Protection	2.6	In-operable	7.7	Production	56.4																																																																																																																																									
Forest Composition and Description																																																																																																																																																
Fir forest with closed canopy having matured stand. Firewood abundant and grazing extensive.						Stand data																																																																																																																																										
						Bas. Area (m2/ha)		19.5																																																																																																																																								
						Volume (m3/ha)		160.8																																																																																																																																								
		Volume conifer %		88%																																																																																																																																												
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p style="text-align: center; font-weight: bold;">Number of trees/ha by diameter class (dbh>10cm)</p> </div> <div style="flex: 2;"> <table border="1" style="font-size: 8px; border-collapse: collapse;"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>82</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>68</td> <td>32</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>5</td> </tr> <tr> <td>Mixed Conifer</td> <td>18</td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>82</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>18</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <th colspan="2" style="text-align: center;">Forest Use</th> <td>I</td> <td>E</td> </tr> <tr> <th colspan="2" style="text-align: center;">Age Class</th> <th>%</th> <th colspan="2" style="text-align: center;">Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td></td> <td>Good</td> <td></td> <td>Grazing</td> <td>9.1</td> <td>59</td> </tr> <tr> <td>Immature</td> <td></td> <td></td> <td>Average</td> <td>86</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>91</td> <td></td> <td>Poor</td> <td>14</td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td>9</td> <td colspan="5" style="text-align: center;">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <th colspan="2" style="text-align: center;">Slope</th> <th>%</th> <th colspan="2" style="text-align: center;">Erosiveness</th> <th>%</th> <th colspan="2" style="text-align: center;">Soil Cover</th> <th>%</th> </tr> <tr> <td>Gentle</td> <td>27</td> <td></td> <td>Stable</td> <td></td> <td>High</td> <td></td> <td>14</td> </tr> <tr> <td>Moderate</td> <td>73</td> <td></td> <td>Moderate</td> <td>86</td> <td>Moderate</td> <td></td> <td>91</td> </tr> <tr> <td>Steep</td> <td></td> <td></td> <td>Unstable</td> <td>14</td> <td>Low</td> <td></td> <td>9</td> </tr> </tbody> </table> </div> </div>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	82	Natural	100	Firewood	68	32	Spruce		Coppice		Bamboo		5	Mixed Conifer	18	Canopy	%	Cane			Blue Pine		Dense		Daphne			Chir Pine		Closed	82				Hardwood		Open	18				Mixed H/C		Unstocked		Forest Use		I	E	Age Class		%	Condition		%	Type	%	%	Young			Good		Grazing	9.1	59	Immature			Average	86	Shokshing			Mature	91		Poor	14	Lopping			Overmature	9	Site Characteristics							Slope		%	Erosiveness		%	Soil Cover		%	Gentle	27		Stable		High		14	Moderate	73		Moderate	86	Moderate		91	Steep			Unstable	14	Low		9
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Gentle	27		Stable		High		14																																																																																																																																									
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Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																																				
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Bluepine																																																																																																																																																
Hemlock																																																																																																																																																
Spruce																																																																																																																																																
Fir	563	241		41	36	14	7	2	1	0	2	103	27																																																																																																																																			
Other Conifers	48	80	72	54	4	1						130	34																																																																																																																																			
Oak																																																																																																																																																
Acer																																																																																																																																																
Betula																																																																																																																																																
Rhododendron	354	354	87	57								145	38																																																																																																																																			
Other Broadleaves																																																																																																																																																
Total	965	675	159	152	40	14	7	2	1	0	2	378	100																																																																																																																																			
Future Management & Monitoring of Activities																																																																																																																																																
Manag. Option	No activities		Matured fir stand with few pockets of juniper stands. Improvement (Felling, Thinning and singling).																																																																																																																																													
	Improvement	√																																																																																																																																														
	Timber Use	√																																																																																																																																														
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	Silvopasture																																																																																																																																															
	Sokshing																																																																																																																																															
Production Potential (N, Volume)				No of trees removed each year																																																																																																																																												
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																																
>50	Drashing	426	8	100	1224																																																																																																																																											
	Firewood	265	5		1514																																																																																																																																											
30-49	Cham	2244	40	85	2347																																																																																																																																											
	Firewood	331	6		308																																																																																																																																											
20-29	Tsim	2716	48	96	1005																																																																																																																																											
	Firewood	5537	98		1399																																																																																																																																											
10-19	Poles, etc.	290	5	97	25																																																																																																																																											
	Firewood	8415	149		626																																																																																																																																											
Silvicultural Measures				Area in ha implemented per year																																																																																																																																												
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																																
Planting																																																																																																																																																
Thinning	35.9	64%																																																																																																																																														
Felling	20.5	36%																																																																																																																																														
Assessment carried out by		SWS										Year:	2019																																																																																																																																			

Sub-Compartment Record																
Geog	Sakteng	Comp.	1Zhengtsangteng	Sub-Comp.	Zhengtsangteng	No.	1B									
Areas in ha																
Non Forest Area	0.5	Protection	2.7	In-operable	18.8	Production	75.4									
Forest Composition and Description																
Mature to over mature fir stand with good regeneration. There were thick rhododendron species with good fir regeneration.						Stand data										
						Bas. Area (m2/ha)	29.1									
						Volume (m3/ha)	373.8									
						Volume conifer %	84%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	80	Natural	100	Firewood						
						Spruce		Coppice		Bamboo						
						Mixed Conifer	20	Canopy	%	Cane						
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed	95							
						Hardwood		Open	5							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	85	Grazing		70				
						Immature		Average	15	Shokshing						
						Mature	85	Poor		Lopping						
						Overmature	15	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle		Stable		High												
Moderate	100	Moderate	100	Moderate	100											
Steep		Unstable		Low												
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	937	531	28	22	14	16	6	4	4	4	13	112	20			
Other Conifers	177	177	96	39	14	6	3	2	2	1		163	29			
Oak																
Acer																
Betula					1							1	0			
Rhododendron	1149	725	226	35	5	1						267	48			
Other Broadleaves			6		1	1				0	3	10	2			
Total	2264	1432	357	96	34	23	9	6	6	6	16	553	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	The sub-compartment has sufficient timber stock with juniper in few pockets.														
	Improvement															
	Timber Use	√														
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year												
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%
>50	Drashing	1656	22	69	8569											
	Firewood	568	8		4964											
30-49	Cham	2673	35	65	2878											
	Firewood	126	2		110											
20-29	Tsim	4145	55	57	1343											
	Firewood															
10-19	Poles, etc.	8955	119	35	835											
	Firewood	426	6		30											
Silvicultural Measures				Area in ha implemented per year												
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%	
Planting																
Thinning	37.7	50%														
Felling	37.7	50%														
Assessment carried out by	SWS												Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	C1Zhengtsangteng	Sub-Comp.	Kenperi	No.	1C										
Areas in ha																	
Non Forest Area	0.6	Protection	1.3	In-operable	14.8	Production	78.0										
Forest Composition and Description																	
Matured fir stand with few mostly matured stand.						Stand data											
						Bas. Area (m2/ha)	15.0										
						Volume (m3/ha)	144.8										
						Volume conifer %	93%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S						
					Hemlock		Plantation		Type	%	%						
					Fir	86	Natural	100	Firewood	24	76						
					Spruce		Coppice		Bamboo								
					Mixed Conifer	14	Canopy	%	Cane								
					Blue Pine		Dense		Daphne								
					Chir Pine		Closed	86									
					Hardwood		Open	10									
					Mixed H/C		Unstocked	5	Forest Use	I	E						
					Age Class	%	Condition	%	Type	%	%						
					Young		Good	10	Grazing	19	57						
					Immature		Average	90	Shokshing								
					Mature	76	Poor		Lopping								
					Overmature	14	Site Characteristics										
					Slope	%	Erosiveness	%	Soil Cover	%							
					Gentle		Stable	10	High								
					Moderate	71	Moderate	76	Moderate	100							
					Steep	29	Unstable	14	Low								
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	825	371	65	19	33	22	2	2			3	146	39				
Other Conifers	34	67	75	25								101	27				
Oak																	
Acer																	
Betula																	
Rhododendron	387	152	113	10								123	33				
Other Broadleaves																	
Total	1246	589	253	54	33	22	2	2			3	369	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	The sub-compartment has good stock of fir timber with few juniper in some parts and have good regeneration. The compartment is located few kilometers from the international boundary.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	161	2	100	440												
	Firewood	415	5		3042												
30-49	Cham	3575	46	87	3943												
	Firewood	93	1		142												
20-29	Tsim	1815	23	100	676												
	Firewood	2420	31		658												
10-19	Poles, etc.	6722	86	100	739												
	Firewood	13023	167		946												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	3.7	5%															
Thinning	66.8	86%															
Felling	7.4	10%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																																																																																																																																				
Geog	Sakteng	Comp.	1Zhengtsangteng	Sub-Comp.	Lhabrateng	No.	1D																																																																																																																													
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Non Forest Area	0.1	Protection	0.2	In-operable	3.9	Production	94.4																																																																																																																													
Forest Composition and Description																																																																																																																																				
The stand consist of young and matured stand dominated by fir species.							Stand data																																																																																																																													
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Spruce																																																																																																																																				
Fir	634	133	118	56	29	11	3	2	1	0	3	222	31																																																																																																																							
Other Conifers			212	19								231	33																																																																																																																							
Oak																																																																																																																																				
Acer			19	8								27	4																																																																																																																							
Betula	103	29	52	2	1							54	8																																																																																																																							
Rhododendron	737	221	165	10								175	25																																																																																																																							
Other Broadleaves																																																																																																																																				
Total	1474	383	566	95	29	11	3	2	1	0	3	710	100																																																																																																																							
Future Management & Monitoring of Activities																																																																																																																																				
Manag. Option	No activities	Improvement thinning, timber use and firewood use recommended.																																																																																																																																		
	Improvement	√																																																																																																																																		
	Timber Use	√																																																																																																																																		
	Firewood Use	√																																																																																																																																		
	Silvopasture																																																																																																																																			
	Sokshing																																																																																																																																			
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																			
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																						
>50	Drashing	317	3	100	854																																																																																																																															
	Firewood	527	6		3582																																																																																																																															
30-49	Cham	2686	28	79	2759																																																																																																																															
	Firewood	312	3		368																																																																																																																															
20-29	Tsim	6568	70	100	2430																																																																																																																															
	Firewood	2403	25		732																																																																																																																															
10-19	Poles, etc.	31151	330	100	3026																																																																																																																															
	Firewood	22251	236		1696																																																																																																																															
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																			
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																							
Planting																																																																																																																																				
Thinning	82.6	88%																																																																																																																																		
Felling	15.7	17%																																																																																																																																		
Assessment carried out by		SWS											Year:	2019																																																																																																																						

Sub-Compartment Record																
Geog	Sakteng	Comp.	1Zhengtsangteng	Sub-Comp.	Dakpashisa	No.	1E									
Areas in ha																
Non Forest Area		Protection	0.8	In-operable	15.1	Production	79.3									
Forest Composition and Description																
Matured fir stand with open canopy. The extraction of timber is ongoing from this sub-compartment.						Stand data										
						Bas. Area (m2/ha)	24.0									
						Volume (m3/ha)	389.7									
						Volume conifer %	94%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	100	Natural	100	Firewood						
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed	29							
						Hardwood		Open	71							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	5	Good		Grazing		100				
						Immature	5	Average	100	Shokshing						
						Mature	90	Poor		Lopping						
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	38	Stable	5	High												
Moderate	62	Moderate	95	Moderate	95											
Steep		Unstable		Low	5											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	674	472	86	25	23	11	5	4	4	5	22	184	37			
Other Conifers	320	168	65	25	3	1						93	19			
Oak																
Acer																
Betula	84	135		2	5	2	0					9	2			
Rhododendron	1213	842	199									199	40			
Other Broadleaves			5	2		1						8	2			
Total	2290	1617	356	54	31	14	5	4	4	5	22	494	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Recommended for timber and firewood use.														
	Improvement															
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year												
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%
>50	Drashing	2437	31	79	18504											
	Firewood	72	1		226											
30-49	Cham	1809	23	65	1874											
	Firewood	473	6		517											
20-29	Tsim	2615	33	71	959											
	Firewood	462	6		157											
10-19	Poles, etc.	9829	124	92	1064											
	Firewood	16240	205		1083											
Silvicultural Measures				Area in ha implemented per year												
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%	
Planting																
Thinning	30.2	38%														
Felling	30.2	38%														
Assessment carried out by				SWS										Year:	2019	

Sub-Compartment Record																	
Geog	Sakteng	Comp.	1Zhengtsangteng	Sub-Comp.	Donglumarpö	No.	1F										
Areas in ha																	
Non Forest Area	1.0	Protection		In-operable		Production	99.0										
Forest Composition and Description																	
Dominated by mixed conifer species and mostly open canopy.						Stand data											
						Bas. Area (m2/ha)	19.0										
						Volume (m3/ha)	94.5										
						Volume conifer %	28%										
					Forest Type	%	Stand Type	%	NWFP+firew.	A	S						
					Hemlock		Plantation		Type	%	%						
					Fir	4	Natural	100	Firewood	88	12						
					Spruce		Coppice		Bamboo								
					Mixed Conifer	76	Canopy	%	Cane								
					Blue Pine		Dense		Daphne								
					Chir Pine		Closed	28									
					Hardwood	12	Open	68									
					Mixed H/C	8	Unstocked	4	Forest Use	i	E						
					Age Class	%	Condition	%	Type	%	%						
					Young	4	Good		Grazing	28	72						
					Immature	28	Average	100	Shokshing								
					Mature	60	Poor		Lopping								
					Overmature	8	Site Characteristics										
					Slope	%	Erosiveness	%	Soil Cover	%							
					Gentle		Stable		High								
					Moderate	76	Moderate	96	Moderate	96							
					Steep	24	Unstable	4	Low	4							
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	141	57	9	10	2						1	22	3				
Other Conifers			86	18								104	13				
Oak																	
Acer																	
Betula			14	3	1							18	2				
Rhododendron			475	96								571	73				
Other Broadleaves			50	15	2	1						68	9				
Total	141	57	634	142	6	1					1	783	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		The sub-compartment has lot of rhododendron stand and need to do thinning to encourage the regeneration of fir species. Firewood use is recommended.														
	Improvement	√															
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing		100														
	Firewood	70	1		715												
30-49	Cham	247	2	88	208												
	Firewood	347	4		286												
20-29	Tsim	10649	108	99	2678												
	Firewood	3227	33		890												
10-19	Poles, etc.	49300	498	100	3360												
	Firewood	13445	136		1081												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	83.2	84%															
Felling																	
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																	
Geog	Sakteng	Comp.	1Zhengtsangteng	Sub-Comp.	Goigoberi	No.	1G										
Areas in ha																	
Non Forest Area	24.8	Protection		In-operable	29.1	Production	26.8										
Forest Composition and Description																	
Mostly tsamdro area having rhododendron growth. Some areas have young oak stand and the area falls in Borangmang water source area.						Stand data											
						Bas. Area (m2/ha)	19.2										
						Volume (m3/ha)	163.9										
						Volume conifer %	58%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	58	Natural	100	Firewood							
						Spruce		Coppice		Bamboo		8					
						Mixed Conifer	8	Canopy	%	Cane							
						Blue Pine		Dense		Daphne		67					
						Chir Pine		Closed									
						Hardwood	33	Open	67								
						Mixed H/C		Unstocked	33	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good		Grazing		75					
						Immature		Average	100	Shokshing							
						Mature	83	Poor		Lopping							
						Overmature	17	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	50	Stable	17	High													
Moderate	50	Moderate	83	Moderate	100												
Steep		Unstable		Low													
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	354	295	9	14	5	3	1	1	0	1	5	40	7				
Other Conifers	206	147	104		2							105	18				
Oak	88	147	113	17	5	1	1	1	0			139	24				
Acer																	
Betula																	
Rhododendron	589	884	236	51	12	4		1				304	52				
Other Broadleaves																	
Total	1238	1474	462	81	24	8	2	3	1	1	5	588	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Firewood recommended from the matured rhododendron species.															
	Improvement																
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	55	2	56	313												
	Firewood	128	5		508												
30-49	Cham	121	5	86	124												
	Firewood	634	24		495												
20-29	Tsim	273	10	96	110												
	Firewood	1822	68		473												
10-19	Poles, etc.	253	9	78	30												
	Firewood	9363	349		667												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	13.4	50%															
Felling	6.7	25%															
Assessment carried out by				SWS									Year:	2019			

Sub-Compartment Record																
Geog	Sakteng	Comp.	1Zhengtsangteng	Sub-Comp.	Jabgoenpa	No.	1H									
Areas in ha																
Non Forest Area	5.6	Protection	2.6	In-operable	25.6	Production	65.7									
Forest Composition and Description																
Matured fir stand with mixed conifer forest. The upper part of the sub-compartment has mixed conifer and lower part occupied with broadleaved forest.						Stand data										
						Bas. Area (m2/ha)	23.7									
						Volume (m3/ha)	141.0									
						Volume conifer %	60%									
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock	6	Plantation		Type	%	%				
						Fir	33	Natural	100	Firewood	39	39				
						Spruce		Coppice		Bamboo	6					
						Mixed Conifer	39	Canopy	%	Cane	6	56				
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed	39							
						Hardwood	17	Open	28							
						Mixed H/C	6	Unstocked	33	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	6	Good		Grazing	11	44				
						Immature	33	Average	100	Shokshing						
						Mature	56	Poor		Lopping						
						Overmature	6	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	33	Stable		High												
Moderate	56	Moderate	100	Moderate	100											
Steep	11	Unstable		Low												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock	138	59	6	7	3	1						17	2			
Spruce																
Fir	39	59		5	3	1				0	2	11	1			
Other Conifers	138	138	226	48	9	6				0	0	290	32			
Oak			6		2							9	1			
Acer			6									6	1			
Betula				5	1		0					6	1			
Rhododendron	295	255	421	29	2							453	49			
Other Broadleaves			113	7	3	1						125	14			
Total	609	511	780	100	25	10	0			1	2	918	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Thinning and firewood use is recommended.													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 50	Drashing	31	0	74	72											
	Firewood	130	2		1217											
30-49	Cham	669	10	79	630											
	Firewood	1155	18		817											
20-29	Tsim	1488	23	80	469											
	Firewood	3720	57		968											
10-19	Poles, etc.	12813	195	98	1111											
	Firewood	37612	572		2583											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	62.1	94%														
Felling	3.7	6%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	2Layphrangma	Sub-Comp.	Layphrangma	No.	2A										
Areas in ha																	
Non Forest Area	0.2	Protection	3.1	In-operable	12.2	Production	89.5										
Forest Composition and Description																	
The overall stand is fir dominant with juniper species as co-dominant stand in some part of the compartment.						Stand data											
						Bas. Area (m2/ha)	16.7										
						Volume (m3/ha)	132.7										
						Volume conifer %	79%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	91	Natural	100	Firewood	32	68					
						Spruce		Coppice		Bamboo							
						Mixed Conifer	9	Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	55								
						Hardwood		Open	36								
						Mixed H/C		Unstocked	9	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	9	Good	9	Grazing	45	36					
						Immature		Average	91	Shokshing							
						Mature	91	Poor		Lopping							
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	5	Stable		High													
Moderate	91	Moderate	95	Moderate	95												
Steep	5	Unstable	5	Low	5												
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	209	241	26	31	21	10	3	2	1	1	2	96	23				
Other Conifers			26	30	8							63	15				
Oak																	
Acer			26	7	4							37	9				
Betula																	
Rhododendron	96	16	206	24								230	54				
Other Broadleaves																	
Total	305	257	283	93	32	10	3	2	1	1	2	426	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Timber and firewood recommended through improvement (thinning and singling).														
	Improvement	√															
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	355	4	100	1053												
	Firewood	420	5		2625												
30-49	Cham	2897	32	89	2809												
	Firewood	423	5		297												
20-29	Tsim	4309	48	98	1545												
	Firewood	3812	43		981												
10-19	Poles, etc.	4144	46	100	459												
	Firewood	21179	237		1506												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	40.7	45%															
Felling	28.5	32%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																																																																																																																																											
Geog	Sakteng	Comp.	2 Layphrangma	Sub-Comp.	Tsherzom	No.	2B																																																																																																																																				
Areas in ha																																																																																																																																											
Non Forest Area		Protection	3.4	In-operable	27.2	Production	69.9																																																																																																																																				
Forest Composition and Description																																																																																																																																											
Fir dominant and have mature to over matured trees with closed canopy cover.						Stand data																																																																																																																																					
						Bas. Area (m2/ha)	23.4																																																																																																																																				
						Volume (m3/ha)	420.4																																																																																																																																				
						Volume conifer %	85%																																																																																																																																				
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>83</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>17</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>17</td> <td>33</td> </tr> <tr> <td>Mixed Conifer</td> <td>17</td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td>6</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>100</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <th colspan="2">Forest Use</th> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <th>Type</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <td></td> <td></td> <td></td> </tr> <tr> <td>Young</td> <td>6</td> <td>Good</td> <td></td> <td>Grazing</td> <td></td> <td>83</td> </tr> <tr> <td>Immature</td> <td>6</td> <td>Average</td> <td>100</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>17</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td>72</td> <th colspan="2">Site Characteristics</th> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th colspan="2">Soil Cover</th> <th>%</th> </tr> <tr> <td>Gentle</td> <td>6</td> <td>Stable</td> <td>6</td> <td>High</td> <td></td> <td></td> </tr> <tr> <td>Moderate</td> <td>106</td> <td>Moderate</td> <td>94</td> <td>Moderate</td> <td></td> <td>100</td> </tr> <tr> <td>Steep</td> <td>22</td> <td>Unstable</td> <td></td> <td>Low</td> <td></td> <td></td> </tr> </tbody> </table>	Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	83	Natural	100	Firewood		17	Spruce		Coppice		Bamboo	17	33	Mixed Conifer	17	Canopy	%	Cane			Blue Pine		Dense		Daphne		6	Chir Pine		Closed	100				Hardwood		Open					Mixed H/C		Unstocked		Forest Use							Type	I	E	Age Class	%	Condition	%				Young	6	Good		Grazing		83	Immature	6	Average	100	Shokshing			Mature	17	Poor		Lopping			Overmature	72	Site Characteristics					Slope	%	Erosiveness	%	Soil Cover		%	Gentle	6	Stable	6	High			Moderate	106	Moderate	94	Moderate		100	Steep	22	Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																					
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Steep	22	Unstable		Low																																																																																																																																							
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)																																																																																																																														
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																														
Chirpine																																																																																																																																											
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Hemlock																																																																																																																																											
Spruce																																																																																																																																											
Fir	354	393	44	27	15	6	8	3	4	5	23	136	39																																																																																																																														
Other Conifers	59	98																																																																																																																																									
Oak				5	1		3		1	0		10	3																																																																																																																														
Acer																																																																																																																																											
Betula	20	20	13	5	1							18	5																																																																																																																														
Rhododendron	472	531	31	54	6	3	1					96	28																																																																																																																														
Other Broadleaves			57	23	7	1	0	0	0			88	25																																																																																																																														
Total	904	1041	145	113	30	10	12	4	6	5	23	349	100																																																																																																																														
Future Management & Monitoring of Activities																																																																																																																																											
Manag. Option	No activities	Improvement (thinning, singling, etc.)																																																																																																																																									
	Improvement	√																																																																																																																																									
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	Silvopasture																																																																																																																																										
	Sokshing																																																																																																																																										
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																										
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																													
> 50	Drashing	1325	19	91	8421																																																																																																																																						
	Firewood	1874	27		14116																																																																																																																																						
30-49	Cham	1262	18	92	1294																																																																																																																																						
	Firewood	1343	19		988																																																																																																																																						
20-29	Tsim	1899	27	100	768																																																																																																																																						
	Firewood	6013	86		1542																																																																																																																																						
10-19	Poles, etc.	3077	44	100	364																																																																																																																																						
	Firewood	7033	101		509																																																																																																																																						
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																										
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																														
Planting																																																																																																																																											
Thinning	19.4	28%																																																																																																																																									
Felling	31.1	44%																																																																																																																																									
Assessment carried out by		SWS										Year:	2019																																																																																																																														

Sub-Compartment Record																
Geog	Sakteng	Comp.	2Layphrangma	Sub-Comp.	Balung	No.	2C									
Areas in ha																
Non Forest Area	9.9	Protection	2.0	In-operable	24.5	Production	63.1									
Forest Composition and Description																
The stand is dominated by mixed conifer forest with thick rhododendron species under growth.						Stand data										
						Bas. Area (m2/ha)	22.7									
						Volume (m3/ha)	419.1									
						Volume conifer %	63%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock	6	Plantation		Type	%	%				
						Fir	11	Natural	100	Firewood		67				
						Spruce		Coppice		Bamboo		22				
						Mixed Conifer	67	Canopy	%	Cane						
						Blue Pine		Dense		Daphne		67				
						Chir Pine		Closed	100							
						Hardwood		Open								
						Mixed H/C	17	Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good		Grazing		83				
						Immature		Average	100	Shokshing						
						Mature	72	Poor		Lopping		5.6				
						Overmature	28	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle	6	Stable		High						
						Moderate	89	Moderate	94	Moderate	100					
						Steep	6	Unstable	6	Low						
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock	216	138			1	1				0	7	9	2			
Spruce																
Fir	648	393	25	11	2	3	1	2	1	2	12	61	13			
Other Conifers	138	98	13		1							14	3			
Oak			75	5	8	5	5	1	1	2	3	105	22			
Acer		39		2	2	1						5	1			
Betula			13	7	6	2	1	0	1			30	6			
Rhododendron	491	393	170	45	20	3						237	51			
Other Broadleaves				5								5	1			
Total	1493	1061	296	75	40	15	7	3	3	4	22	465	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Improvement (thinning, singling, etc.) is needed. Currently, the timber and firewood are extracted from this sub-compartment.														
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	% (m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	282	4	91	1211											
	Firewood	2028	32		18844											
30-49	Cham	1853	29	82	1398											
	Firewood	1008	16		1021											
20-29	Tsim	3997	63	100	1107											
	Firewood	714	11		219											
10-19	Poles, etc.	11897	189	89	853											
	Firewood	4759	75		385											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	21.0	33%														
Thinning	24.5	39%														
Felling																
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	2Layphrangma	Sub-Comp.	Brakshaktang	No.	2D										
Areas in ha																	
Non Forest Area	32.2	Protection	3.0	In-operable	30.4	Production	45.6										
Forest Composition and Description																	
Mixed H/C forest with closed canopy and sparsely distributed NWFP like daphne.						Stand data											
						Bas. Area (m2/ha)	21.2										
						Volume (m3/ha)	103.7										
						Volume conifer %	18%										
					Forest Type	%	Stand Type	%	NWFP+firew.	A	S						
					Hemlock		Plantation		Type	%	%						
					Fir		Natural	100	Firewood	33	67						
					Spruce		Coppice		Bamboo								
					Mixed Conifer	7	Canopy	%	Cane								
					Blue Pine		Dense	7	Daphne	20	47						
					Chir Pine		Closed	40									
					Hardwood	20	Open	27									
					Mixed H/C	73	Unstocked	27	Forest Use	I	E						
					Age Class	%	Condition	%	Type	%	%						
					Young	20	Good		Grazing	13	47						
					Immature	27	Average	100	Shokshing								
					Mature	47	Poor		Lopping								
					Overmature	7	Site Characteristics										
					Slope	%	Erosiveness	%	Soil Cover	%							
					Gentle		Stable		High								
					Moderate	67	Moderate	100	Moderate	100							
					Steep	33	Unstable		Low								
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	71	24	8	3	1							11	1				
Other Conifers	47	71	98	16	3	1						118	14				
Oak																	
Acer																	
Betula																	
Rhododendron	71	24	641	19								660	76				
Other Broadleaves			15	35	21	6	1	1				79	9				
Total	189	118	762	73	24	8	1	1				869	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Improvement (thinning and singling of rhododendron species). The sub-compartment is already exploited. Only few fir stands are available in pockets which are not sound for timber extraction. The under growth is mostly the rhododendron and juniper.														
	Improvement																
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing		100														
	Firewood	106	2		265												
30-49	Cham	165	4	87	128												
	Firewood	1064	23		888												
20-29	Tsim	1239	27	85	333												
	Firewood	1610	35		443												
10-19	Poles, etc.	34062	747	100	2370												
	Firewood	688	15		49												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	39.5	87%															
Felling																	
Assessment carried out by		SWS										Year:	2019				

Sub-Compartment Record																
Geog	Sakteng	Comp.	3Sangtangsa	Sub-Comp.	Sangtangsa	No.	3A									
Areas in ha																
Non Forest Area	2.4	Protection	3.4	In-operable	15.0	Production	78.8									
Forest Composition and Description																
The compartment has matured fir stand.						Stand data										
						Bas. Area (m2/ha)	18.8									
						Volume (m3/ha)	124.6									
						Volume conifer %	71%									
<p>Number of trees/ha by diameter class (dbh>10cm)</p>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
					Hemlock		Plantation		Type	%	%					
					Fir	76	Natural	100	Firewood	24	76					
					Spruce		Coppice		Bamboo							
					Mixed Conifer	24	Canopy	%	Cane							
					Blue Pine		Dense		Daphne		5					
					Chir Pine		Closed	71								
					Hardwood		Open	14								
					Mixed H/C		Unstocked	14	Forest Use	I	E					
					Age Class	%	Condition	%	Type	%	%					
					Young	5	Good		Grazing	52	48					
					Immature	5	Average	90	Shokshing							
					Mature	86	Poor	10	Lopping							
					Overmature	5	Site Characteristics									
					Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	10	Stable		High												
Moderate	90	Moderate	100	Moderate	100											
Steep		Unstable		Low												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	84	51	11	37	14	7	2	1	0	1	1	75	11			
Other Conifers			146	23	1							170	25			
Oak																
Acer				2								2	0			
Betula			11	4	2							17	2			
Rhododendron	84	185	388	17								405	60			
Other Broadleaves			11	2								13	2			
Total	168	236	566	85	17	7	2	1	0	1	1	681	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Improvement (thinning and singling, etc.) The sub-compartment has more tsamdro areas .													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year												
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%
>50	Drashing	140	2	93	370											
	Firewood	305	4		1929											
30-49	Cham	1361	17	76	1448											
	Firewood	78	1		51											
20-29	Tsim	4739	60	98	1688											
	Firewood	1834	23		451											
10-19	Poles, etc.	10191	129	100	904											
	Firewood	34396	437		2350											
Silvicultural Measures				Area in ha implemented per year												
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%	
Planting																
Thinning	45.0	57%														
Felling	18.8	24%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	3Sangtangsa	Sub-Comp.	Zomla	No.	3B																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	3.5	Protection	2.3	In-operable	7.8	Production	90.2																																																																																																																																	
Forest Composition and Description																																																																																																																																								
The sub-compartment has fir dominated stand with closed canopy.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	14.6																																																																																																																																	
						Volume (m3/ha)	112.4																																																																																																																																	
						Volume conifer %	60%																																																																																																																																	
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Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
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Fir	123	46	59	25	12	4	1	1	1	0	1	103	25																																																																																																																											
Other Conifers			30	34	2							65	16																																																																																																																											
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Betula																																																																																																																																								
Rhododendron	384	215	192	39								231	55																																																																																																																											
Other Broadleaves				11	5	2	1	1			1	19	5																																																																																																																											
Total	507	261	280	108	18	5	2	1	1	0	2	418	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities		The lower belt is mostly broadleaved forest which could be allotted for firewood. Timber use is also recommended.																																																																																																																																					
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>50	Drashing	352	4	100	1792																																																																																																																																			
	Firewood	225	2		1486																																																																																																																																			
30-49	Cham	2024	22	95	1861																																																																																																																																			
	Firewood																																																																																																																																							
20-29	Tsim	4153	46	95	1371																																																																																																																																			
	Firewood	5111	57		1270																																																																																																																																			
10-19	Poles, etc.	7986	89	100	857																																																																																																																																			
	Firewood	17302	192		1152																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year											Total	%																																																																																																																								
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Thinning	43.1	48%																																																																																																																																						
Felling	35.3	39%																																																																																																																																						
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Non Forest Area	1.7	Protection	3.4	In-operable	12.0	Production	88.3																																																																																																																																	
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Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
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Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																												
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Fir	1077	450	26	9	10	7	7	4	8	6	27	105	43																																																																																																																											
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Acer	80	145		22	9	1						32	13																																																																																																																											
Betula	241	225	36	13	8	3	2	1	0			62	25																																																																																																																											
Rhododendron	434	402	41	2	3	1						46	19																																																																																																																											
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Total	1833	1222	103	46	30	11	8	5	9	6	27	246	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities		Felling for timber and firewood recommended. In some areas the improvement activity like thinning is suggested.																																																																																																																																					
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>50	Drashing	2286	26	82	14806																																																																																																																																			
	Firewood	1733	20		13473																																																																																																																																			
30-49	Cham	1707	19	90	1880																																																																																																																																			
	Firewood	1569	18		1209																																																																																																																																			
20-29	Tsim	1144	13	100	438																																																																																																																																			
	Firewood	2942	33		947																																																																																																																																			
10-19	Poles, etc.	2270	26	100	268																																																																																																																																			
	Firewood	6811	77		534																																																																																																																																			
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Felling	68.2	77%																																																																																																																																						
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Non Forest Area	13.4	Protection	1.2	In-operable	38.5	Production	49.1																																																																																																																																											
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Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																												
Hemlock		Plantation		Type	%	%																																																																																																																																												
Fir	21	Natural	100	Firewood	29	71																																																																																																																																												
Spruce		Coppice		Bamboo																																																																																																																																														
Mixed Conifer	79	Canopy	%	Cane																																																																																																																																														
Blue Pine		Dense	21	Daphne		14																																																																																																																																												
Chir Pine		Closed	64																																																																																																																																															
Hardwood		Open	14																																																																																																																																															
Mixed H/C		Unstocked		Forest Use		I	E																																																																																																																																											
Age Class		%	Condition	%	Type	%	%																																																																																																																																											
Young			Good		Grazing	57	43																																																																																																																																											
Immature	43		Average	79	Shokshing																																																																																																																																													
Mature	57		Poor	21	Lopping	7.1																																																																																																																																												
Overmature			Site Characteristics																																																																																																																																															
Slope		%	Erosiveness	%	Soil Cover		%																																																																																																																																											
Gentle	14		Stable	29	High																																																																																																																																													
Moderate	50		Moderate	50	Moderate		71																																																																																																																																											
Steep	36		Unstable	21	Low		29																																																																																																																																											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																																						
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																																					
Chirpine																																																																																																																																																		
Bluepine																																																																																																																																																		
Hemlock																																																																																																																																																		
Spruce																																																																																																																																																		
Fir	985	227		12	4	4	1	2	0	0	6	29	3																																																																																																																																					
Other Conifers	25			15								15	2																																																																																																																																					
Oak	152				1	7	7	4	3	2	16	39	5																																																																																																																																					
Acer				3								3	0																																																																																																																																					
Betula					1	1		1	0	1		4	0																																																																																																																																					
Rhododendron	1718	1667	534	172	36	13	3	0				757	89																																																																																																																																					
Other Broadleaves	126																																																																																																																																																	
Total	3006	1895	534	201	43	24	11	7	4	2	22	847	100																																																																																																																																					
Future Management & Monitoring of Activities																																																																																																																																																		
Manag. Option	No activities		Improvement (thinning) of rhododendron species is needed to encourage fir regeneration.																																																																																																																																															
	Improvement	√																																																																																																																																																
	Timber Use	√																																																																																																																																																
	Firewood Use	√																																																																																																																																																
	Silvopasture																																																																																																																																																	
	Sokshing																																																																																																																																																	
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																																	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																																				
> 50	Drashing	779	16	82	4891																																																																																																																																													
	Firewood	1044	21		8430																																																																																																																																													
30-49	Cham	278	6	87	310																																																																																																																																													
	Firewood	2585	53		1957																																																																																																																																													
20-29	Tsim			93																																																																																																																																														
	Firewood	9137	186		2182																																																																																																																																													
10-19	Poles, etc.			100																																																																																																																																														
	Firewood	26174	534		1742																																																																																																																																													
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																																	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																																					
Planting	10.5	21%																																																																																																																																																
Thinning	38.5	79%																																																																																																																																																
Felling																																																																																																																																																		
Assessment carried out by		SWS											Year:	2019																																																																																																																																				

Sub-Compartment Record																	
Geog	Sakteng	Comp.	4Chunakpo	Sub-Comp.	Chunakpo	No.	4A										
Areas in ha																	
Non Forest Area	7.5	Protection	2.1	In-operable	29.2	Production	61.9										
Forest Composition and Description																	
Mature fir stand with good regeneration.						Stand data											
						Bas. Area (m2/ha)	15.8										
						Volume (m3/ha)	144.2										
						Volume conifer %	70%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	100	Natural	100	Firewood	24	76					
						Spruce		Coppice		Bamboo							
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed	41								
						Hardwood		Open	59								
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good	65	Grazing	82	18					
						Immature	6	Average	35	Shokshing							
						Mature	94	Poor		Lopping		100					
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle		Stable	65	High													
Moderate	18	Moderate	24	Moderate	94												
Steep	82	Unstable	12	Low	6												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	520	936	67		17	13	11				3	111	33				
Other Conifers																	
Oak																	
Acer				53								53	16				
Betula				26								26	8				
Rhododendron	208	312	100	48								148	44				
Other Broadleaves																	
Total	728	1248	166	127	17	13	11				3	338	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Recommended for timber and firewood use. One and half hour walk fom Sakteng.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	653	11	93	3046												
	Firewood	184	3		429												
30-49	Cham	1672	27	91	1907												
	Firewood																
20-29	Tsim			57													
	Firewood	4454	72		1455												
10-19	Poles, etc.	4124	67	40	487												
	Firewood																
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	10.9	18%															
Thinning	47.4	76%															
Felling	3.6	6%															
Assessment carried out by		SWS												Year:	2019		

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	4Chunakpo	Sub-Comp.	Domsagang	No.	4B																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area		Protection	1.5	In-operable	74.4	Production	23.5																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Average condition fir forest with open canopy closure.							Stand data																																																																																																																																	
							Bas. Area (m2/ha)	14.3																																																																																																																																
							Volume (m3/ha)	146.8																																																																																																																																
							Volume conifer %	83%																																																																																																																																
<p>Number of trees/ha by diameter class (dbh>10cm)</p>							<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>83</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>33</td> <td>67</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td></td> </tr> <tr> <td>Mixed Conifer</td> <td>17</td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>17</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>50</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>33</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <td>Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>17</td> <td>Grazing</td> <td>33</td> <td>67</td> </tr> <tr> <td>Immature</td> <td>33</td> <td>Average</td> <td>50</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>67</td> <td>Poor</td> <td>33</td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="2">Site Characteristics</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td colspan="2">%</td> </tr> <tr> <td>Gentle</td> <td>17</td> <td>Stable</td> <td>33</td> <td>High</td> <td colspan="2">33</td> </tr> <tr> <td>Moderate</td> <td>33</td> <td>Moderate</td> <td>33</td> <td>Moderate</td> <td colspan="2">67</td> </tr> <tr> <td>Steep</td> <td>50</td> <td>Unstable</td> <td>33</td> <td>Low</td> <td colspan="2"></td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	83	Natural	100	Firewood	33	67	Spruce		Coppice		Bamboo			Mixed Conifer	17	Canopy	%	Cane			Blue Pine		Dense		Daphne			Chir Pine		Closed	17				Hardwood		Open	50				Mixed H/C		Unstocked	33	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	17	Grazing	33	67	Immature	33	Average	50	Shokshing			Mature	67	Poor	33	Lopping			Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	17	Stable	33	High	33		Moderate	33	Moderate	33	Moderate	67		Steep	50	Unstable	33	Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
Hemlock		Plantation		Type	%	%																																																																																																																																		
Fir	83	Natural	100	Firewood	33	67																																																																																																																																		
Spruce		Coppice		Bamboo																																																																																																																																				
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Blue Pine		Dense		Daphne																																																																																																																																				
Chir Pine		Closed	17																																																																																																																																					
Hardwood		Open	50																																																																																																																																					
Mixed H/C		Unstocked	33	Forest Use	I	E																																																																																																																																		
Age Class	%	Condition	%	Type	%	%																																																																																																																																		
Young		Good	17	Grazing	33	67																																																																																																																																		
Immature	33	Average	50	Shokshing																																																																																																																																				
Mature	67	Poor	33	Lopping																																																																																																																																				
Overmature		Site Characteristics																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle	17	Stable	33	High	33																																																																																																																																			
Moderate	33	Moderate	33	Moderate	67																																																																																																																																			
Steep	50	Unstable	33	Low																																																																																																																																				
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																												
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																											
Chirpine																																																																																																																																								
Bluepine																																																																																																																																								
Hemlock																																																																																																																																								
Spruce																																																																																																																																								
Fir	3183	413	38	27	17	15	1	2	2		5	106	37																																																																																																																											
Other Conifers			19	7		2						28	10																																																																																																																											
Oak																																																																																																																																								
Acer				14								14	5																																																																																																																											
Betula																																																																																																																																								
Rhododendron	648	1120	94	41	3	2						141	49																																																																																																																											
Other Broadleaves																																																																																																																																								
Total	3832	1533	151	88	21	19	1	2	2	5	288	100																																																																																																																												
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities	Timber and firewood recommended from the stable site of the sub-compartment.																																																																																																																																						
	Improvement	√																																																																																																																																						
	Timber Use	√																																																																																																																																						
	Firewood Use	√																																																																																																																																						
	Silvopasture																																																																																																																																							
	Sokshing																																																																																																																																							
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing	95	4	89	715																																																																																																																																			
	Firewood	104	4		700																																																																																																																																			
30-49	Cham	392	17	77	438																																																																																																																																			
	Firewood	328	14		380																																																																																																																																			
20-29	Tsim	160	7	77	64																																																																																																																																			
	Firewood	1436	61		372																																																																																																																																			
10-19	Poles, etc.			63																																																																																																																																				
	Firewood	2216	94		148																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																							
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting	7.8	33%																																																																																																																																						
Thinning	3.9	17%																																																																																																																																						
Felling	3.9	17%																																																																																																																																						
Assessment carried out by		SWS											Year:	2019																																																																																																																										

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	4Chunakpo	Sub-Comp.	Rangnga	No.	4C																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	1.5	Protection	5.1	In-operable	50.7	Production	39.8																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Fir stand with good regeneration.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	18.5																																																																																																																																	
						Volume (m3/ha)	125.3																																																																																																																																	
						Volume conifer %	66%																																																																																																																																	
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>82</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>45</td> <td>45</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>9</td> </tr> <tr> <td>Mixed Conifer</td> <td>18</td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td>18</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>27</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>64</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>9</td> <th>Forest Use</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>55</td> <td>Grazing</td> <td>100</td> <td></td> </tr> <tr> <td>Immature</td> <td>9</td> <td>Average</td> <td>36</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>91</td> <td>Poor</td> <td>9</td> <td>Lopping</td> <td></td> <td>100</td> </tr> <tr> <td>Overmature</td> <td></td> <th>Site Characteristics</th> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>9</td> <td>Stable</td> <td>55</td> <td>High</td> <td></td> <td></td> </tr> <tr> <td>Moderate</td> <td>9</td> <td>Moderate</td> <td>45</td> <td>Moderate</td> <td></td> <td>100</td> </tr> <tr> <td>Steep</td> <td>82</td> <td>Unstable</td> <td></td> <td>Low</td> <td></td> <td></td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	82	Natural	100	Firewood	45	45	Spruce		Coppice		Bamboo		9	Mixed Conifer	18	Canopy	%	Cane			Blue Pine		Dense		Daphne		18	Chir Pine		Closed	27				Hardwood		Open	64				Mixed H/C		Unstocked	9	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	55	Grazing	100		Immature	9	Average	36	Shokshing			Mature	91	Poor	9	Lopping		100	Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	9	Stable	55	High			Moderate	9	Moderate	45	Moderate		100	Steep	82	Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
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Fir	82	Natural	100	Firewood	45	45																																																																																																																																		
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Blue Pine		Dense		Daphne		18																																																																																																																																		
Chir Pine		Closed	27																																																																																																																																					
Hardwood		Open	64																																																																																																																																					
Mixed H/C		Unstocked	9	Forest Use	I	E																																																																																																																																		
Age Class	%	Condition	%	Type	%	%																																																																																																																																		
Young		Good	55	Grazing	100																																																																																																																																			
Immature	9	Average	36	Shokshing																																																																																																																																				
Mature	91	Poor	9	Lopping		100																																																																																																																																		
Overmature		Site Characteristics																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle	9	Stable	55	High																																																																																																																																				
Moderate	9	Moderate	45	Moderate		100																																																																																																																																		
Steep	82	Unstable		Low																																																																																																																																				
Species	Height	N/ha per diameter class										Total (> 10cm)																																																																																																																												
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																											
Chirpine																																																																																																																																								
Bluepine																																																																																																																																								
Hemlock																																																																																																																																								
Spruce																																																																																																																																								
Fir	579	932		59	17	15	5		2			98	18																																																																																																																											
Other Conifers																																																																																																																																								
Oak																																																																																																																																								
Acer																																																																																																																																								
Betula				41								41	7																																																																																																																											
Rhododendron		1768	370									370	66																																																																																																																											
Other Broadleaves			51									51	9																																																																																																																											
Total	579	2701	422	100	17	15	5		2			561	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities		Thinning recommended.																																																																																																																																					
	Improvement	√																																																																																																																																						
	Timber Use																																																																																																																																							
	Firewood Use																																																																																																																																							
	Silvopasture																																																																																																																																							
	Sokshing																																																																																																																																							
Production Potential (N, Volume)				No of trees removed each year										Total	%																																																																																																																									
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing	234	6	83	722																																																																																																																																			
	Firewood																																																																																																																																							
30-49	Cham	1224	31	96	1423																																																																																																																																			
	Firewood																																																																																																																																							
20-29	Tsim	2212	56	93	894																																																																																																																																			
	Firewood	1475	37		500																																																																																																																																			
10-19	Poles, etc.			98																																																																																																																																				
	Firewood	16388	412		1100																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year										Total	%																																																																																																																									
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting	3.6	9%																																																																																																																																						
Thinning	7.2	18%																																																																																																																																						
Felling																																																																																																																																								
Assessment carried out by		SWS										Year:	2019																																																																																																																											

Sub-Compartment Record																	
Geog	Sakteng	Comp.	4Chunakpo	Sub-Comp.	Chabchuna	No.	4D										
Areas in ha																	
Non Forest Area	9.1	Protection	0.9	In-operable	44.1	Production	47.8										
Forest Composition and Description																	
Even age mixed conifer stand with few Acer and Betula species.						Stand data											
						Bas. Area (m2/ha)	26.0										
						Volume (m3/ha)	283.2										
						Volume conifer %	45%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	38	Natural	100	Firewood	100						
						Spruce		Coppice		Bamboo							
						Mixed Conifer	62	Canopy	%	Cane							
						Blue Pine		Dense		Daphne	15	8					
						Chir Pine		Closed	54								
						Hardwood		Open	46								
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good		Grazing	23	92					
						Immature	8	Average	77	Shokshing							
						Mature	92	Poor	23	Lopping							
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	8	Stable	8	High													
Moderate	46	Moderate	54	Moderate	62												
Steep	46	Unstable	38	Low	38												
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	1605	517	17	16	2	3	1		2	1	9	51	8				
Other Conifers					2							2	0				
Oak			9	9	8	7	3	1		1	3	41	6				
Acer				9	2		1					12	2				
Betula						1	1		0			2	0				
Rhododendron	680	517	392	147	18		2					559	84				
Other Broadleaves	381	163															
Total	2666	1197	418	182	30	11	7	1	3	2	12	665	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Thinning recommended as the stand is in pole stage.														
	Improvement	√															
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	245	5	94	1001												
	Firewood	867	18		6968												
30-49	Cham	292	6	81	322												
	Firewood	1301	27		987												
20-29	Tsim			84													
	Firewood	7339	154		1769												
10-19	Poles, etc.			94													
	Firewood	18722	392		1246												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	3.7	8%															
Thinning	36.8	77%															
Felling	7.4	15%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	4Chunakpo	Sub-Comp.	Naglagang	No.	4E																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	10.3	Protection	1.4	In-operable	19.1	Production	76.5																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Mixed conifer stand with some matured fir forest with timber of harvestable size.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	15.5																																																																																																																																	
						Volume (m3/ha)	123.0																																																																																																																																	
						Volume conifer %	60%																																																																																																																																	
<p>Number of trees/ha by diameter class (dbh>10cm)</p>					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>25</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>30</td> <td>75</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td></td> </tr> <tr> <td>Mixed Conifer</td> <td>75</td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td>5</td> <td>20</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>15</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>70</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>15</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <td>Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td></td> <td>Grazing</td> <td>70</td> <td>30</td> </tr> <tr> <td>Immature</td> <td>10</td> <td>Average</td> <td>90</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>90</td> <td>Poor</td> <td>10</td> <td>Lopping</td> <td></td> <td>100</td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="4">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <td>Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td colspan="2">%</td> </tr> <tr> <td>Gentle</td> <td>15</td> <td>Stable</td> <td>65</td> <td>High</td> <td colspan="2"></td> </tr> <tr> <td>Moderate</td> <td>35</td> <td>Moderate</td> <td>35</td> <td>Moderate</td> <td colspan="2">100</td> </tr> <tr> <td>Steep</td> <td>50</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2"></td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	25	Natural	100	Firewood	30	75	Spruce		Coppice		Bamboo			Mixed Conifer	75	Canopy	%	Cane			Blue Pine		Dense		Daphne	5	20	Chir Pine		Closed	15				Hardwood		Open	70				Mixed H/C		Unstocked	15	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good		Grazing	70	30	Immature	10	Average	90	Shokshing			Mature	90	Poor	10	Lopping		100	Overmature		Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle	15	Stable	65	High			Moderate	35	Moderate	35	Moderate	100		Steep	50	Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
Hemlock		Plantation		Type	%	%																																																																																																																																		
Fir	25	Natural	100	Firewood	30	75																																																																																																																																		
Spruce		Coppice		Bamboo																																																																																																																																				
Mixed Conifer	75	Canopy	%	Cane																																																																																																																																				
Blue Pine		Dense		Daphne	5	20																																																																																																																																		
Chir Pine		Closed	15																																																																																																																																					
Hardwood		Open	70																																																																																																																																					
Mixed H/C		Unstocked	15	Forest Use	I	E																																																																																																																																		
Age Class	%	Condition	%	Type	%	%																																																																																																																																		
Young		Good		Grazing	70	30																																																																																																																																		
Immature	10	Average	90	Shokshing																																																																																																																																				
Mature	90	Poor	10	Lopping		100																																																																																																																																		
Overmature		Site Characteristics																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle	15	Stable	65	High																																																																																																																																				
Moderate	35	Moderate	35	Moderate	100																																																																																																																																			
Steep	50	Unstable		Low																																																																																																																																				
Species	Height 0.3<1.3 m	N/ha per diameter class									Total (> 10cm)																																																																																																																													
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																											
Chirpine																																																																																																																																								
Bluepine																																																																																																																																								
Hemlock																																																																																																																																								
Spruce																																																																																																																																								
Fir	849	442	108	24	7	9	5				2	155	37																																																																																																																											
Other Conifers																																																																																																																																								
Oak																																																																																																																																								
Acer			6	35	6							47	11																																																																																																																											
Betula			34	4	8							46	11																																																																																																																											
Rhododendron	495	884	113	61								174	41																																																																																																																											
Other Broadleaves																																																																																																																																								
Total	1344	1326	260	124	22	9	5				2	422	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities	Timber and firewood use.																																																																																																																																						
	Improvement																																																																																																																																							
	Timber Use	√																																																																																																																																						
	Firewood Use	√																																																																																																																																						
	Silvopasture																																																																																																																																							
	Sokshing																																																																																																																																							
Production Potential (N, Volume)				No of trees removed each year										Total	%																																																																																																																									
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing	322	4	94	751																																																																																																																																			
	Firewood	147	2		1508																																																																																																																																			
30-49	Cham	878	11	90	1078																																																																																																																																			
	Firewood	1274	17		1147																																																																																																																																			
20-29	Tsim	5609	73	84	1611																																																																																																																																			
	Firewood	2337	31		749																																																																																																																																			
10-19	Poles, etc.	16013	209	91	1445																																																																																																																																			
	Firewood	2164	28		199																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year										Total	%																																																																																																																									
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting	22.9	30%																																																																																																																																						
Thinning	30.6	40%																																																																																																																																						
Felling	11.5	15%																																																																																																																																						
Assessment carried out by		SWS											Year:	2019																																																																																																																										

Sub-Compartment Record																	
Geog	Sakteng	Comp.	5Pusa Top	Sub-Comp.	Zhemshatsey	No.	5C										
Areas in ha																	
Non Forest Area	1.5	Protection	5.1	In-operable	48.8	Production	45.0										
Forest Composition and Description																	
Fir stand with few mixed conifer species. Located in steep slope and has poor regeneration.						Stand data											
						Bas. Area (m2/ha)	29.7										
						Volume (m3/ha)	358.1										
						Volume conifer %	76%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S						
					Hemlock		Plantation		Type	%	%						
					Fir	83	Natural	100	Firewood	33	75						
					Spruce		Coppice		Bamboo								
					Mixed Conifer	17	Canopy	%	Cane								
					Blue Pine		Dense		Daphne								
					Chir Pine		Closed	33									
					Hardwood		Open	67									
					Mixed H/C		Unstocked		Forest Use	I	E						
					Age Class	%	Condition	%	Type	%	%						
					Young	8	Good	8	Grazing	25	83						
					Immature	25	Average	25	Shokshing								
					Mature	67	Poor	67	Lopping								
					Overmature		Site Characteristics										
					Slope	%	Erosiveness	%	Soil Cover	%							
Gentle	8	Stable	8	High													
Moderate	8	Moderate	25	Moderate	8												
Steep	83	Unstable	67	Low	92												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	1356	560	160	65	16	3	4	2	0	1	16	267	28				
Other Conifers			170	10	3							183	19				
Oak																	
Acer			85	34	9	5	2					135	14				
Betula			9	7	7	4	1					28	3				
Rhododendron	531	413	274	54								328	35				
Other Broadleaves																	
Total	1886	973	698	170	35	13	6	2	0	1	16	941	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Need protection in the steep slope. Need plantation activity. However, the judicious allotment of firewood can be permitted.														
	Improvement	√															
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	408	9	100	3272												
	Firewood	751	17		5522												
30-49	Cham	281	6	83	262												
	Firewood	1486	33		1437												
20-29	Tsim	306	7	70	124												
	Firewood	5045	112		1459												
10-19	Poles, etc.	849	19	57	100												
	Firewood	16986	377		1355												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	18.8	42%															
Thinning	22.5	50%															
Felling	3.8	8%															
Assessment carried out by		SWS												Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	5Pusa Top	Sub-Comp.	Gothorong	No.	5D										
Areas in ha																	
Non Forest Area	2.7	Protection	0.8	In-operable	26.7	Production	68.8										
Forest Composition and Description																	
Immature fir stand with good regeneration.						Stand data											
						Bas. Area (m2/ha)	24.9										
						Volume (m3/ha)	396.0										
						Volume conifer %	84%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S						
					Hemlock		Plantation		Type	%	%						
					Fir	83	Natural	100	Firewood	22	83						
					Spruce		Coppice		Bamboo								
					Mixed Conifer	17	Canopy	%	Cane								
					Blue Pine		Dense		Daphne								
					Chir Pine		Closed	33									
					Hardwood		Open	61									
					Mixed H/C		Unstocked	6	Forest Use	I	E						
					Age Class	%	Condition	%	Type	%	%						
					Young		Good	11	Grazing	50	50						
					Immature	44	Average	39	Shokshing								
					Mature	56	Poor	50	Lopping								
					Overmature		Site Characteristics										
					Slope	%	Erosiveness	%	Soil Cover								
					Gentle	17	Stable	11	High								
					Moderate	50	Moderate	56	Moderate	44							
					Steep	33	Unstable	39	Low	56							
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock	39																
Spruce																	
Fir	1906	668	94	57	9	13	1	1	3	1	23	202	28				
Other Conifers	255	138	50	14	3							67	9				
Oak																	
Acer	255		50	23	8	2		1				84	12				
Betula																	
Rhododendron	1159	825	314	57	7							378	52				
Other Broadleaves																	
Total	3615	1631	509	149	28	15	1	2	3	1	23	731	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Recommended for improvement activity like plantation and thinning for poles. Felling can be done for timber use too.														
	Improvement	√															
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	552	8	96	4588												
	Firewood	1448	21		13277												
30-49	Cham	911	13	77	1230												
	Firewood	1335	19		1018												
20-29	Tsim	1712	25	71	613												
	Firewood	5603	81		1452												
10-19	Poles, etc.			69													
	Firewood	24211	352		1716												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	15.3	22%															
Thinning	42.0	61%															
Felling	7.6	11%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																																																																																																																																									
Geog	Sakteng	Comp.	5Pusa top	Sub-Comp.	Nuglu	No.	5E																																																																																																																																		
Areas in ha																																																																																																																																									
Non Forest Area	16.2	Protection	3.1	In-operable	28.2	Production	50.1																																																																																																																																		
Forest Composition and Description																																																																																																																																									
Fir stand with thick rhododendron under growth.						Stand data																																																																																																																																			
						Bas. Area (m2/ha)	18.1																																																																																																																																		
						Volume (m3/ha)	314.3																																																																																																																																		
						Volume conifer %	90%																																																																																																																																		
					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew. Type</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Firewood</td> <td>75</td> <td>19</td> </tr> <tr> <td>Fir</td> <td>100</td> <td>Natural</td> <td>100</td> <td>Bamboo</td> <td>13</td> <td>13</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Daphne</td> <td>6</td> <td>19</td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>81</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>19</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <th colspan="2">Forest Use</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>69</td> <td>Grazing</td> <td>44</td> <td>19</td> </tr> <tr> <td>Immature</td> <td>25</td> <td>Average</td> <td>31</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>75</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <th colspan="4">Site Characteristics</th> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th>%</th> <td></td> </tr> <tr> <td>Gentle</td> <td>50</td> <td>Stable</td> <td>88</td> <td>High</td> <td>63</td> <td></td> </tr> <tr> <td>Moderate</td> <td>50</td> <td>Moderate</td> <td>13</td> <td>Moderate</td> <td>38</td> <td></td> </tr> <tr> <td>Steep</td> <td></td> <td>Unstable</td> <td></td> <td>Low</td> <td></td> <td></td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew. Type	A	S	Hemlock		Plantation		Firewood	75	19	Fir	100	Natural	100	Bamboo	13	13	Spruce		Coppice		Cane			Mixed Conifer		Canopy	%	Daphne	6	19	Blue Pine		Dense					Chir Pine		Closed	81				Hardwood		Open	19				Mixed H/C		Unstocked		Forest Use		I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	69	Grazing	44	19	Immature	25	Average	31	Shokshing			Mature	75	Poor		Lopping			Overmature		Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle	50	Stable	88	High	63		Moderate	50	Moderate	13	Moderate	38		Steep		Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew. Type	A	S																																																																																																																																			
Hemlock		Plantation		Firewood	75	19																																																																																																																																			
Fir	100	Natural	100	Bamboo	13	13																																																																																																																																			
Spruce		Coppice		Cane																																																																																																																																					
Mixed Conifer		Canopy	%	Daphne	6	19																																																																																																																																			
Blue Pine		Dense																																																																																																																																							
Chir Pine		Closed	81																																																																																																																																						
Hardwood		Open	19																																																																																																																																						
Mixed H/C		Unstocked		Forest Use		I	E																																																																																																																																		
Age Class	%	Condition	%	Type	%	%																																																																																																																																			
Young		Good	69	Grazing	44	19																																																																																																																																			
Immature	25	Average	31	Shokshing																																																																																																																																					
Mature	75	Poor		Lopping																																																																																																																																					
Overmature		Site Characteristics																																																																																																																																							
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																				
Gentle	50	Stable	88	High	63																																																																																																																																				
Moderate	50	Moderate	13	Moderate	38																																																																																																																																				
Steep		Unstable		Low																																																																																																																																					
Species	Height	N/ha per diameter class										Total (> 10cm)																																																																																																																													
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																												
Chirpine																																																																																																																																									
Bluepine																																																																																																																																									
Hemlock	22																																																																																																																																								
Spruce																																																																																																																																									
Fir	1282	398	191	43	19	11	4	2	0	0	19	289	50																																																																																																																												
Other Conifers			7									7	1																																																																																																																												
Oak																																																																																																																																									
Acer			21									21	4																																																																																																																												
Betula			14	13	1							28	5																																																																																																																												
Rhododendron	1481	707	163	31								193	34																																																																																																																												
Other Broadleaves			35		1							37	6																																																																																																																												
Total	2785	1105	431	87	22	11	4	2	0	0	19	576	100																																																																																																																												
Future Management & Monitoring of Activities																																																																																																																																									
Manag. Option	No activities		Improvement (thinning, singling).																																																																																																																																						
	Improvement																																																																																																																																								
	Timber Use	√																																																																																																																																							
	Firewood Use	√																																																																																																																																							
	Silvopasture																																																																																																																																								
Sokshing																																																																																																																																									
Production Potential (N, Volume)				No of trees removed each year										Total	%																																																																																																																										
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
>50	Drashing	667	13	54	5402																																																																																																																																				
	Firewood																																																																																																																																								
30-49	Cham	1019	20	73	1171																																																																																																																																				
	Firewood	195	4		150																																																																																																																																				
20-29	Tsim	766	15	62	285																																																																																																																																				
	Firewood	1914	38		499																																																																																																																																				
10-19	Poles, etc.	709	14	49	84																																																																																																																																				
	Firewood	9925	198		814																																																																																																																																				
Silvicultural Measures				Area in ha implemented per year										Total	%																																																																																																																										
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																												
Planting	9.4	19%																																																																																																																																							
Thinning	37.6	75%																																																																																																																																							
Felling	3.1	6%																																																																																																																																							
Assessment carried out by		SWS										Year:	2019																																																																																																																												

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	6Meserteng	Sub-Comp.	Rinakpo	No.	6A																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	22.7	Protection	1.8	In-operable	55.8	Production	31.4																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Even aged class fir with open canopy cover. Landslides was observed in some part of the sub-compartment.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	21.3																																																																																																																																	
						Volume (m3/ha)	408.3																																																																																																																																	
						Volume conifer %	95%																																																																																																																																	
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Forest Type	%	Stand Type	%	NWFP+firew. Type	A	S																																																																																																																																		
Hemlock		Plantation																																																																																																																																						
Fir	100	Natural	100	Firewood	33	78																																																																																																																																		
Spruce		Coppice		Bamboo																																																																																																																																				
Mixed Conifer		Canopy	%	Cane																																																																																																																																				
Blue Pine		Dense		Daphne																																																																																																																																				
Chir Pine		Closed	44																																																																																																																																					
Hardwood		Open	56																																																																																																																																					
Mixed H/C		Unstocked		Forest Use	I	E																																																																																																																																		
Age Class	%	Condition	%	Type	%	%																																																																																																																																		
Young		Good	11	Grazing	56	44																																																																																																																																		
Immature		Average	22	Shokshing																																																																																																																																				
Mature	78	Poor	67	Lopping																																																																																																																																				
Overmature	22	Site Characteristics																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle		Stable		High	11																																																																																																																																			
Moderate	44	Moderate	44	Moderate	33																																																																																																																																			
Steep	56	Unstable	56	Low	56																																																																																																																																			
Species		Height	N/ha per diameter class										Total (> 10cm)																																																																																																																											
		0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Chirpine																																																																																																																																								
Bluepine																																																																																																																																								
Hemlock																																																																																																																																								
Spruce																																																																																																																																								
Fir		236	1650	75	5	7	6	12	6	6	2	26	144	35																																																																																																																										
Other Conifers			747	13	9	5	3	2	1				32	8																																																																																																																										
Oak																																																																																																																																								
Acer																																																																																																																																								
Betula																																																																																																																																								
Rhododendron		1179	2633	201	32								233	57																																																																																																																										
Other Broadleaves																																																																																																																																								
Total		1415	5030	289	45	12	8	14	7	6	2	26	408	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities		Felling of over matured trees as firewood is recommended.																																																																																																																																					
	Improvement	√																																																																																																																																						
	Timber Use																																																																																																																																							
	Firewood Use	√																																																																																																																																						
	Silvopasture																																																																																																																																							
	Sokshing																																																																																																																																							
Production Potential (N, Volume)				No of trees removed each year											Total	%																																																																																																																								
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing	441	14	85	2578																																																																																																																																			
	Firewood	993	32		7051																																																																																																																																			
30-49	Cham			81																																																																																																																																				
	Firewood	509	16		526																																																																																																																																			
20-29	Tsim			100																																																																																																																																				
	Firewood	1421	45		370																																																																																																																																			
10-19	Poles, etc.			96																																																																																																																																				
	Firewood	8685	277		687																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year											Total	%																																																																																																																								
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting	20.9	67%																																																																																																																																						
Thinning	10.5	33%																																																																																																																																						
Felling																																																																																																																																								
Assessment carried out by		SWS										Year:	2019																																																																																																																											

Sub-Compartment Record																	
Geog	Sakteng	Comp.	6Meserteng	Sub-Comp.	Nahizhong	No.	6B										
Areas in ha																	
Non Forest Area	9.8	Protection	2.5	In-operable	26.0	Production	55.1										
Forest Composition and Description																	
Fir stand with open canopy and poor regeneration. Steep slope and landslide affected area.						Stand data											
						Bas. Area (m2/ha)	17.1										
						Volume (m3/ha)	140.6										
						Volume conifer %	75%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	100	Natural	100	Firewood	12	100					
						Spruce		Coppice		Bamboo		59					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense		Daphne							
						Chir Pine		Closed									
						Hardwood		Open	76								
						Mixed H/C		Unstocked	24	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good		Grazing	88	12					
						Immature		Average	88	Shokshing							
						Mature	100	Poor	12	Lopping		100					
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
						Gentle		Stable		High							
						Moderate	65	Moderate	88	Moderate	76						
						Steep	35	Unstable	12	Low	24						
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	520	416		26	27	18	10	6				88	45				
Other Conifers																	
Oak																	
Acer				31								31	16				
Betula					15							15	8				
Rhododendron	104	208		60								60	31				
Other Broadleaves																	
Total	624	624		117	42	18	10	6				194	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Fir stands needs felling. Some area are open having poor regeneration and therefore needed improvement (regeneration).														
	Improvement	√															
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	371	7	85	959												
	Firewood	387	7		1090												
30-49	Cham	2030	37	67	2303												
	Firewood	204	4		310												
20-29	Tsim	3040	55	98	1085												
	Firewood	3304	60		779												
10-19	Poles, etc.			###													
	Firewood																
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	9.7	18%															
Thinning	45.4	82%															
Felling																	
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																
Geog	Sakteng	Comp.	6Meserteng	Sub-Comp.	Saleyrong	No.	6C									
Areas in ha																
Non Forest Area	10.7	Protection	2.0	In-operable	52.0	Production	29.3									
Forest Composition and Description																
Fir stand with open canopy coverage.						Stand data										
						Bas. Area (m2/ha)	16.0									
						Volume (m3/ha)	122.6									
						Volume conifer %	62%									
					Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
					Hemlock		Plantation		Type	%	%					
					Fir	78	Natural	100	Firewood	22	78					
					Spruce		Coppice		Bamboo		78					
					Mixed Conifer		Canopy	%	Cane							
					Blue Pine		Dense		Daphne							
					Chir Pine		Closed	11								
					Hardwood	22	Open	89								
					Mixed H/C		Unstocked		Forest Use	I	E					
					Age Class	%	Condition	%	Type	%	%					
					Young		Good		Grazing	100						
					Immature		Average	100	Shokshing							
					Mature	100	Poor		Lopping		100					
					Overmature		Site Characteristics									
					Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	22	Stable		High												
Moderate	78	Moderate	100	Moderate	100											
Steep		Unstable		Low												
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	589	393		23	7	6	8	9				53	20			
Other Conifers					2							2	1			
Oak																
Acer				63	32	5						99	37			
Betula				25	23							48	18			
Rhododendron	79	236		68								68	25			
Other Broadleaves																
Total	668	629	88	145	14	6	8	9				270	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Improvement (thinning and singling).													
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	372	13	71	1094											
	Firewood															
30-49	Cham	366	13	64	411											
	Firewood															
20-29	Tsim	1855	63	91	660											
	Firewood	1987	68		468											
10-19	Poles, etc.	2576	88	100	283											
	Firewood															
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting	16.3	56%														
Thinning	13.0	44%														
Felling																
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	6Meserteng	Sub-Comp.	Meserteng	No.	6D																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	20.5	Protection	2.4	In-operable	43.1	Production	28.7																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Fir dominant stand with some broadleaved forest in some parts of the sub-compartment.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	15.4																																																																																																																																	
						Volume (m3/ha)	230.3																																																																																																																																	
						Volume conifer %	80%																																																																																																																																	
					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>70</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>40</td> <td>50</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>60</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td>10</td> <td>20</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>30</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>30</td> <td>Open</td> <td>50</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>20</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <td>Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>10</td> <td>Grazing</td> <td>40</td> <td>20</td> </tr> <tr> <td>Immature</td> <td>10</td> <td>Average</td> <td>70</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>90</td> <td>Poor</td> <td>20</td> <td>Lopping</td> <td></td> <td>50</td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="4">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <td>Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td>%</td> <td></td> </tr> <tr> <td>Gentle</td> <td>40</td> <td>Stable</td> <td>10</td> <td>High</td> <td></td> <td></td> </tr> <tr> <td>Moderate</td> <td>60</td> <td>Moderate</td> <td>60</td> <td>Moderate</td> <td>80</td> <td></td> </tr> <tr> <td>Steep</td> <td></td> <td>Unstable</td> <td>10</td> <td>Low</td> <td>20</td> <td></td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	70	Natural	100	Firewood	40	50	Spruce		Coppice		Bamboo		60	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne	10	20	Chir Pine		Closed	30				Hardwood	30	Open	50				Mixed H/C		Unstocked	20	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	10	Grazing	40	20	Immature	10	Average	70	Shokshing			Mature	90	Poor	20	Lopping		50	Overmature		Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle	40	Stable	10	High			Moderate	60	Moderate	60	Moderate	80		Steep		Unstable	10	Low	20	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
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Chir Pine		Closed	30																																																																																																																																					
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Mature	90	Poor	20	Lopping		50																																																																																																																																		
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Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle	40	Stable	10	High																																																																																																																																				
Moderate	60	Moderate	60	Moderate	80																																																																																																																																			
Steep		Unstable	10	Low	20																																																																																																																																			
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																												
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																											
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Hemlock																																																																																																																																								
Spruce																																																																																																																																								
Fir	1521	531	11		1	11	1	2	1	13	40	11																																																																																																																												
Other Conifers	672	1061			6						6	2																																																																																																																												
Oak																																																																																																																																								
Acer			23		2	3					27	7																																																																																																																												
Betula			11	4			1	1			17	5																																																																																																																												
Rhododendron	707	990	226	49	2	3	2				282	76																																																																																																																												
Other Broadleaves	318	1450																																																																																																																																						
Total	3218	4032	272	53	10	6	13	2	2	1	13	372	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities		Improvement (regeneration).																																																																																																																																					
	Improvement	√																																																																																																																																						
	Timber Use																																																																																																																																							
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	Sokshing																																																																																																																																							
Production Potential (N, Volume)				No of trees removed each year										Total	%																																																																																																																									
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing	397	14	82	2384																																																																																																																																			
	Firewood	328	11		2463																																																																																																																																			
30-49	Cham	36	1	88	50																																																																																																																																			
	Firewood	383	13		331																																																																																																																																			
20-29	Tsim	117	4	100	40																																																																																																																																			
	Firewood	1404	49		331																																																																																																																																			
10-19	Poles, etc.			96																																																																																																																																				
	Firewood	7476	260		539																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year										Total	%																																																																																																																									
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting	17.2	60%																																																																																																																																						
Thinning	11.5	40%																																																																																																																																						
Felling																																																																																																																																								
Assessment carried out by		SWS										Year:	2019																																																																																																																											

Sub-Compartment Record																
Geog	Sakteng	Comp.	7Tsebchen-Mangdi	Sub-Comp.	Tsebchen-Mangdi	No.	7A									
Areas in ha																
Non Forest Area	13.5	Protection	1.4	In-operable	19.4	Production	61.5									
Forest Composition and Description																
Gentle slope area with a good stand of broadleaved species. Good coverage of bamboo species with less regeneration.						Stand data										
						Bas. Area (m2/ha)	27.5									
						Tot. Vol. (m3/ha)	329.3									
						Vconifer %	3%									
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood	68	32				
						Spruce		Coppice		Bamboo	26	42				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	47	Daphne	53	47				
						Chir Pine		Closed	21							
						Hardwood	79	Open	32							
						Mixed H/C	21	Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	11	Good	47	Grazing	47	42				
						Immature	47	Average	53	Shokshing						
						Mature	42	Poor		Lopping	21					
						Overmature										
						Site Characteristics										
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle	42	Stable		High						
						Moderate	42	Moderate	32	Moderate	26					
						Steep	16	Unstable	68	Low	74					
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.																
Exbucklandia																
Litsea spp.																
Michelia spp.																
Persea spp.																
Quercus spp.			24	15	19	13	8	3	0		10	91	22			
Schima spp.																
Walnut																
Other Broadleave	987	800	143	77	56	23	9	1				309	73			
Conifer spp.			6	6	5	2	0					20	5			
Total	987	800	173	99	80	38	17	4	0		10	420	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Improvement (thinning) of rhododendron and quercus species for firewood.													
	Improvement	√														
	Timber Use															
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027		
> 50	Drashing															
	Firewood	1369	22	72	6679											
30-49	Cham	365	6	62	324											
	Firewood	4104	67		3864											
20-29	Tsim			24												
	Firewood	1450	24		393											
10-19	Poles, etc.															
	Firewood															
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
Planting																
Thinning	32.4	53%														
Felling	25.9	42%														
Assessment carried out by		SWS										Year:	2018			

Sub-Compartment Record																																																																																																																																														
Geog	Sakteng	Comp.	7Tsebchen-Mangdi	Sub-Comp.	Bethangtse	No.	7B																																																																																																																																							
Areas in ha																																																																																																																																														
Non Forest Area	18.2	Protection	1.5	In-operable	24.0	Production	50.9																																																																																																																																							
Forest Composition and Description																																																																																																																																														
Mixed H/C forest with over matured stand,						Stand data																																																																																																																																								
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Oak		42		2		3	4	6	4	3	54	77	15																																																																																																																																	
Acer					1	7	5	4	1			19	4																																																																																																																																	
Betula				2			1	1	0		3	8	2																																																																																																																																	
Rhododendron	333	1123	126	62	18	22	8	9	3	2	5	257	51																																																																																																																																	
Other Broadleaves		42	47	36	9	12	5	4	1	0	11	124	25																																																																																																																																	
Total	333	1207	173	103	28	44	24	27	10	7	88	504	100																																																																																																																																	
Future Management & Monitoring of Activities																																																																																																																																														
Manag. Option	No activities		Thinning of undesire species for firewood can be carried out. The thick rhododendron under growth shall be thinned to encourage the regeneration of desired timber species.																																																																																																																																											
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> 50	Drashing	973	19	59	12522																																																																																																																																									
	Firewood	3720	73		30633																																																																																																																																									
30-49	Cham			36																																																																																																																																										
	Firewood	1339	26		1188																																																																																																																																									
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	Firewood	1343	26		321																																																																																																																																									
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	Firewood	2374	47		158																																																																																																																																									
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Broadleaved stands with some oak and rhododendron species.						Stand data																																																																																																																																						
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Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																						
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		Steep	31	Unstable	31	Low																																																																																																																																						
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																																
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Oak	66		21	31	22	6	5	5	1	0	3	94	25																																																																																																																															
Acer			7	5	4	2						18	5																																																																																																																															
Betula			14	8	8	2						31	8																																																																																																																															
Rhododendron	442	442	35	18	6	2	1					63	16																																																																																																																															
Other Broadleaves	442	752	78	41	16	7	4	4	1			149	39																																																																																																																															
Total	951	1194	177	104	57	20	9	9	1	0	3	380	100																																																																																																																															
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Manag. Option	No activities	Allotment of oak and rhododendron as firewood is suggested.																																																																																																																																										
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Production Potential (N, Volume)				No of trees removed each year																																																																																																																																								
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>50	Drashing	141	3	53	433																																																																																																																																							
	Firewood	488	9		3164																																																																																																																																							
30-49	Cham	363	7	34	300																																																																																																																																							
	Firewood	1018	19		917																																																																																																																																							
20-29	Tsim	273	5	17	64																																																																																																																																							
	Firewood	682	13		219																																																																																																																																							
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Planting	3.3	6%																																																																																																																																										
Thinning	23.4	44%																																																																																																																																										
Felling	16.7	31%																																																																																																																																										
Assessment carried out by		SWS											Year:	2019																																																																																																																														

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Areas in ha																																																																																																																																							
Non Forest Area	10.5	Protection	4.2	In-operable	27.2	Production	57.7																																																																																																																																
Forest Composition and Description																																																																																																																																							
Mixed H/C stand with some matured oak stands.						Stand data																																																																																																																																	
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						Volume conifer %	43%																																																																																																																																
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>94</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>24</td> <td>65</td> </tr> <tr> <td>Mixed Conifer</td> <td>29</td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>12</td> <td>Daphne</td> <td>47</td> <td>53</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>35</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>18</td> <td>Open</td> <td>18</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td>53</td> <td>Unstocked</td> <td>35</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td>6</td> <td>Good</td> <td>35</td> <td>Grazing</td> <td>5.9</td> <td>94</td> </tr> <tr> <td>Immature</td> <td>24</td> <td>Average</td> <td>41</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>59</td> <td>Poor</td> <td>24</td> <td>Lopping</td> <td>53</td> <td>47</td> </tr> <tr> <td>Overmature</td> <td>12</td> <td colspan="2">Site Characteristics</td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>6</td> <td>Stable</td> <td>29</td> <td>High</td> <td colspan="2">29</td> </tr> <tr> <td>Moderate</td> <td>59</td> <td>Moderate</td> <td>53</td> <td>Moderate</td> <td colspan="2">47</td> </tr> <tr> <td>Steep</td> <td>35</td> <td>Unstable</td> <td>18</td> <td>Low</td> <td colspan="2">24</td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood		94	Spruce		Coppice		Bamboo	24	65	Mixed Conifer	29	Canopy	%	Cane			Blue Pine		Dense	12	Daphne	47	53	Chir Pine		Closed	35				Hardwood	18	Open	18				Mixed H/C	53	Unstocked	35	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young	6	Good	35	Grazing	5.9	94	Immature	24	Average	41	Shokshing			Mature	59	Poor	24	Lopping	53	47	Overmature	12	Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	6	Stable	29	High	29		Moderate	59	Moderate	53	Moderate	47		Steep	35	Unstable	18	Low	24	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																	
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Blue Pine		Dense	12	Daphne	47	53																																																																																																																																	
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Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																											
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Chirpine																																																																																																																																							
Bluepine	104	83		5	5	4	2	1	1		5	23	8																																																																																																																										
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Other Conifers				2	4	3		1				10	4																																																																																																																										
Oak	62	21		5		1	0		0		21	28	10																																																																																																																										
Acer			7	2	5	2						16	6																																																																																																																										
Betula			7		7	2						16	6																																																																																																																										
Rhododendron	354	333	40	26	6	1	1	1	0			76	28																																																																																																																										
Other Broadleaves	395	229	13	17	16	8	2	2			3	61	22																																																																																																																										
Total	915	666	80	62	53	26	7	6	1		42	277	100																																																																																																																										
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>50	Drashing	714	12	45	7347																																																																																																																																		
	Firewood	738	13		7575																																																																																																																																		
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	Firewood	949	16		857																																																																																																																																		
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Thinning	10.2	18%																																																																																																																																					
Felling	23.8	41%																																																																																																																																					
Assessment carried out by		SWS										Year:	2019																																																																																																																										

Sub-Compartment Record																
Geog	Sakteng	Comp.	8Mirkhe-Thongbro	Sub-Comp.	Yardam	No.	8C									
Areas in ha																
Non Forest Area	10.0	Protection	2.8	In-operable	44.5	Production	41.1									
Forest Composition and Description																
Mixed H/C stand with majority open canopy coverage.						Stand data										
						Bas. Area (m2/ha)	29.5									
						Volume (m3/ha)	419.0									
						Volume conifer %	62%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood		92				
						Spruce		Coppice		Bamboo	75	17				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense		Daphne		75				
						Chir Pine		Closed	42							
						Hardwood		Open	58							
						Mixed H/C	100	Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	17	Grazing	17	42				
						Immature	17	Average	67	Shokshing						
						Mature	83	Poor	17	Lopping	25	17				
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	% %					
Gentle	8	Stable	42	High	17											
Moderate	42	Moderate	42	Moderate	42											
Steep	50	Unstable	17	Low	42											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	206				3		1	1	2	22		30	6			
Other Conifers	29		9	7								16	3			
Oak																
Acer																
Betula				7	10	5	6	3	2			32	6			
Rhododendron	855	973	132	65	23	8	1	2	1			230	44			
Other Broadleaves	177	206	132	58	14	10	2	2	1			219	41			
Total	1267	1179	274	136	47	27	8	7	5	2	22	528	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Improvement (regeneration) and felling for timber.													
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)					No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	560	14	79	5266											
	Firewood	883	22		5723											
30-49	Cham	129	3	37	196											
	Firewood	985	24		839											
20-29	Tsim			23												
	Firewood	1256	31		316											
10-19	Poles, etc.			3												
	Firewood	388	9		28											
Silvicultural Measures					Area in ha implemented per year										Total	%
Measure	Area (ha)	in %														
Planting	3.4	8%														
Thinning	3.4	8%														
Felling	24.0	58%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																																																																																																																																						
Geog	Sakteng	Comp.	8Mirkhe-Thongbro	Sub-Comp.	Laitse	No.	8D																																																																																																																															
Areas in ha																																																																																																																																						
Non Forest Area		Protection	8.6	In-operable	67.8	Production	21.4																																																																																																																															
Forest Composition and Description																																																																																																																																						
Fir stand with mostly un stock canopy.						Stand data																																																																																																																																
						Bas. Area (m2/ha)	16.7																																																																																																																															
						Volume (m3/ha)	121.1																																																																																																																															
						Volume conifer %	60%																																																																																																																															
				<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>100</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>17</td> <td>50</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>50</td> <td>50</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td>17</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>33</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td>17</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>50</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <td>Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td></td> <td>Grazing</td> <td>67</td> <td></td> </tr> <tr> <td>Immature</td> <td>17</td> <td>Average</td> <td>67</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>67</td> <td>Poor</td> <td>33</td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td>17</td> <td colspan="4">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <td>Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td>%</td> <td></td> </tr> <tr> <td>Gentle</td> <td>17</td> <td>Stable</td> <td></td> <td>High</td> <td></td> <td></td> </tr> <tr> <td>Moderate</td> <td>33</td> <td>Moderate</td> <td>67</td> <td>Moderate</td> <td>67</td> <td></td> </tr> <tr> <td>Steep</td> <td>50</td> <td>Unstable</td> <td>33</td> <td>Low</td> <td>33</td> <td></td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	100	Natural	100	Firewood	17	50	Spruce		Coppice		Bamboo	50	50	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne		17	Chir Pine		Closed	33				Hardwood		Open	17				Mixed H/C		Unstocked	50	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good		Grazing	67		Immature	17	Average	67	Shokshing			Mature	67	Poor	33	Lopping			Overmature	17	Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle	17	Stable		High			Moderate	33	Moderate	67	Moderate	67		Steep	50	Unstable	33	Low	33	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																
Hemlock		Plantation		Type	%	%																																																																																																																																
Fir	100	Natural	100	Firewood	17	50																																																																																																																																
Spruce		Coppice		Bamboo	50	50																																																																																																																																
Mixed Conifer		Canopy	%	Cane																																																																																																																																		
Blue Pine		Dense		Daphne		17																																																																																																																																
Chir Pine		Closed	33																																																																																																																																			
Hardwood		Open	17																																																																																																																																			
Mixed H/C		Unstocked	50	Forest Use	I	E																																																																																																																																
Age Class	%	Condition	%	Type	%	%																																																																																																																																
Young		Good		Grazing	67																																																																																																																																	
Immature	17	Average	67	Shokshing																																																																																																																																		
Mature	67	Poor	33	Lopping																																																																																																																																		
Overmature	17	Site Characteristics																																																																																																																																				
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																	
Gentle	17	Stable		High																																																																																																																																		
Moderate	33	Moderate	67	Moderate	67																																																																																																																																	
Steep	50	Unstable	33	Low	33																																																																																																																																	
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																										
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																									
Chirpine																																																																																																																																						
Bluepine																																																																																																																																						
Hemlock																																																																																																																																						
Spruce																																																																																																																																						
Fir	766	472	57	20	10	19	8					115	30																																																																																																																									
Other Conifers																																																																																																																																						
Oak																																																																																																																																						
Acer			38	20	7	4						69	18																																																																																																																									
Betula			19		3							22	6																																																																																																																									
Rhododendron	589	589	132	34	7							173	45																																																																																																																									
Other Broadleaves				7								7	2																																																																																																																									
Total	1356	1061	245	81	28	23	8					386	100																																																																																																																									
Future Management & Monitoring of Activities																																																																																																																																						
Manag. Option	No activities		Improvement (regeneration) is required.																																																																																																																																			
	Improvement	√																																																																																																																																				
	Timber Use																																																																																																																																					
	Firewood Use																																																																																																																																					
	Silvopasture																																																																																																																																					
	Sokshing																																																																																																																																					
Production Potential (N, Volume)				No of trees removed each year										Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																								
>50	Drashing																																																																																																																																					
	Firewood	150	7	83	350																																																																																																																																	
30-49	Cham	402	19	60	467																																																																																																																																	
	Firewood	254	12		314																																																																																																																																	
20-29	Tsim																																																																																																																																					
	Firewood																																																																																																																																					
10-19	Poles, etc.																																																																																																																																					
	Firewood																																																																																																																																					
Silvicultural Measures				Area in ha implemented per year										Total	%																																																																																																																							
Measure	Area (ha)		in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																								
Planting																																																																																																																																						
Thinning	3.6		17%																																																																																																																																			
Felling	3.6		17%																																																																																																																																			
Assessment carried out by		SWS											Year:	2019																																																																																																																								

Sub-Compartment Record																	
Geog	Sakteng	Comp.	8Mirkhe-Thongbro	Sub-Comp.	Throngbro	No.	8E										
Areas in ha																	
Non Forest Area	2.7	Protection	4.4	In-operable	29.1	Production	61.9										
Forest Composition and Description																	
Stand of mixed H/C with bamboo under growth.						Stand data											
						Bas. Area (m2/ha)	18.1										
						Tot. Vol. (m3/ha)	227.9										
						Vconifer %	4%										
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir		Natural	100	Firewood	29	65					
						Spruce		Coppice		Bamboo	100						
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense	6	Daphne	35	12					
						Chir Pine		Closed	24								
						Hardwood		Open	47								
						Mixed H/C	100	Unstocked	24	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	12	Good		Grazing	53	47					
						Immature	47	Average	82	Shokshing							
						Mature	29	Poor	18	Lopping	18	29					
						Overmature	12	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	6	Stable	29	High	12												
Moderate	65	Moderate	59	Moderate	71												
Steep	29	Unstable	12	Low	18												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Beilschmiedia spp.																	
Cinnamomum spp.		42															
Exbucklandia																	
Litsea spp.																	
Michelia spp.																	
Persea spp.																	
Quercus spp.			20	5	2	1		0	0			29	8				
Schima spp.																	
Walnut																	
Other Broadleave	416	583	133	79	32	18	5	3	1		10	282	81				
Conifer spp.	125	146	20	7	6	1						35	10				
Total	541	770	173	91	40	21	5	3	1		10	346	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Abundant bamboo species and less timber stock. However, firewood can be allotted from this sub-compartment.															
	Improvement																
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing		53														
	Firewood	664	11		4299												
30-49	Cham	273	4	58	198												
	Firewood	1927	31		1631												
20-29	Tsim	148	2	29	38												
	Firewood	1483	24		402												
10-19	Poles, etc.																
	Firewood																
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	21.8	35%															
Felling	10.9	18%															
Assessment carried out by		SWS												Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	9Benangtse	Sub-Comp.	Benangtse	No.	9A										
Areas in ha																	
Non Forest Area	22.9	Protection	7.2	In-operable	17.5	Production	69.9										
Forest Composition and Description																	
Mixed H/C stand with rhododendron under growth.						Stand data											
						Bas. Area (m2/ha)	17.9										
						Volume (m3/ha)	285.4										
						Volume conifer %	78%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock	5	Plantation		Type	%	%					
						Fir	20	Natural	100	Firewood		70					
						Spruce		Coppice		Bamboo	20	30					
						Mixed Conifer	5	Canopy	%	Cane							
						Blue Pine		Dense	5	Daphne	10	50					
						Chir Pine		Closed	55								
						Hardwood		Open	25								
						Mixed H/C	70	Unstocked	15	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	15	Good	25	Grazing	50	20					
						Immature	35	Average	60	Shokshing							
						Mature	45	Poor	15	Lopping	25	5					
						Overmature	5	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	5	Stable	25	High	20												
Moderate	65	Moderate	50	Moderate	65												
Steep	30	Unstable	25	Low	15												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine	53	35	17	10	4							31	6				
Hemlock			23	4	3	1						31	6				
Spruce																	
Fir	159	212	23	4	2	4	3	1	1	1	17	55	11				
Other Conifers																	
Oak																	
Acer			6									6	1				
Betula		35	23	10	14	1		0	0	0		48	10				
Rhododendron	937	654	147	31	6					0		184	37				
Other Broadleaves	354	442	108	31	6							144	29				
Total	1503	1379	345	90	35	6	3	1	1	1	17	500	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Felling of over matured trees.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	749	11	80	6249												
	Firewood	577	8		5377												
30-49	Cham	772	11	70	782												
	Firewood	1235	18		883												
20-29	Tsim	997	14	48	347												
	Firewood	1994	29		524												
10-19	Poles, etc.	1978	28	34	177												
	Firewood	6331	91		432												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	7.0	10%															
Thinning	10.5	15%															
Felling	35.0	50%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																
Geog	Sakteng	Comp.	9Benangtse	Sub-Comp.	Tabkangbro	No.	9B									
Areas in ha																
Non Forest Area	1.8	Protection	5.3	In-operable	28.6	Production	60.9									
Forest Composition and Description																
Fir stand with less regeneration. Some parts of the area are steep and prone to erosion.						Stand data										
						Bas. Area (m2/ha)	18.0									
						Volume (m3/ha)	134.5									
						Volume conifer %	74%									
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir	100	Natural	100	Firewood		53				
						Spruce		Coppice		Bamboo	18					
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	47	Daphne						
						Chir Pine		Closed	18							
						Hardwood		Open	29							
						Mixed H/C		Unstocked	6	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	35	Grazing	18	29				
						Immature	6	Average	53	Shokshing						
						Mature	71	Poor	12	Lopping	12					
						Overmature	24	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	18	Stable	24	High	12											
Moderate	53	Moderate	47	Moderate	76											
Steep	29	Unstable	29	Low	12											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock																
Spruce																
Fir	187	166	120	89	35	10	1	0				255	55			
Other Conifers																
Oak																
Acer			40	26	1							68	15			
Betula			7	10	4							20	4			
Rhododendron	42	62	73	12	4							89	19			
Other Broadleaves			27	5	2							34	7			
Total	229	229	266	141	46	10	1	0				465	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Harvesting of matured trees required to encourage the fir regeneration.														
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)					No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50																
Drashing																
Firewood																
30-49																
Cham	1551	25	55	1580												
Firewood	343	6		321												
20-29																
Tsim	2771	46	49	1084												
Firewood	1459	24		534												
10-19																
Poles, etc.	2836	47	38	335												
Firewood	3241	53		303												
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	3.6	6%														
Felling	35.8	59%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	9Benangtse	Sub-Comp.	Zampakhajuk	No.	9C										
Areas in ha																	
Non Forest Area	1.8	Protection	10.9	In-operable	32.4	Production	35.2										
Forest Composition and Description																	
The sub-compartment consist of mixed H/C and mixed conifer forests and the area lies in rocky and steep area.						Stand data											
						Bas. Area (m2/ha)	20.5										
						Volume (m3/ha)	271.1										
						Volume conifer %	81%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir		Natural	100	Firewood		69					
						Spruce		Coppice		Bamboo	62	15					
						Mixed Conifer	38	Canopy	%	Cane							
						Blue Pine	15	Dense	38	Daphne	15	23					
						Chir Pine		Closed	23								
						Hardwood		Open	31								
						Mixed H/C	46	Unstocked	8	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	8	Good	23	Grazing	38	15					
						Immature	46	Average	77	Shokshing							
						Mature	31	Poor		Lopping	7.7	23					
						Overmature	15	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	31	Stable	38	High	23												
Moderate	31	Moderate	31	Moderate	54												
Steep	46	Unstable	31	Low	23												
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine	299	354	96	38	11	5	2		0		6	157	36				
Hemlock	109	136		6	6	10	1					23	5				
Spruce																	
Fir	27			6								6	1				
Other Conifers				6	5	2	1	1		0	5	20	5				
Oak				3			1					4	1				
Acer																	
Betula																	
Rhododendron	408	463	52	28	6	3						90	21				
Other Broadleaves	109	245	87	34	6	5	1	0	1	0		135	31				
Total	952	1197	235	122	35	24	5	2	1	1	11	435	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	The area need to be monitored to control the lopping of trees. Thinning of rhododendron species is recommended to encourage the regeneration.															
	Improvement	√															
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	81	2	22	213												
	Firewood	62	2		155												
30-49	Cham	497	14	42	547												
	Firewood	373	11		365												
20-29	Tsim	1102	31	49	367												
	Firewood	992	28		261												
10-19	Poles, etc.	918	26	15	77												
	Firewood	306	9		22												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	2.7	8%															
Thinning	18.9	54%															
Felling	10.8	31%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																
Geog	Sakteng	Comp.	9Benangtse	Sub-Comp.	Bainangtse	No.	9D									
Areas in ha																
Non Forest Area	0.8	Protection	3.2	In-operable	6.7	Production	77.1									
Forest Composition and Description																
Mixed H/C stand with dense canopy in some part of the sub-compartment.							Stand data									
							Bas. Area (m2/ha)	20.3								
							Volume (m3/ha)	339.6								
							Volume conifer %	80%								
					Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
					Hemlock		Plantation		Type	%	%					
					Fir	13	Natural	100	Firewood	4	52					
					Spruce		Coppice		Bamboo	26	48					
					Mixed Conifer		Canopy	3%	Cane							
					Blue Pine		Dense	39	Daphne		22					
					Chir Pine		Closed	22								
					Hardwood		Open	30								
					Mixed H/C	87	Unstocked	9	Forest Use	I	E					
					Age Class	%	Condition	%	Type	%	%					
					Young	13	Good	43	Grazing	39						
					Immature	13	Average	43	Shokshing							
					Mature	61	Poor	13	Lopping		4.3					
					Overmature	13	Site Characteristics									
					Slope	%	Erosiveness	%	Soil Cover	%						
					Gentle	22	Stable	22	High	9						
					Moderate	39	Moderate	57	Moderate	74						
					Steep	39	Unstable	22	Low	17						
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine	77	62	20	5								25	5			
Hemlock										0		0	0			
Spruce																
Fir	461	384	59	58	24	4	1		1	1	20	167	34			
Other Conifers						1						1	0			
Oak																
Acer			44	41	11							96	19			
Betula			25	19	12	1	0					57	11			
Rhododendron	953	1246	79	19	2							100	20			
Other Broadleaves	154	92	25	18	5							48	10			
Total	1645	1784	251	161	54	5	1		1	1	20	494	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Some areas are steep and needed protection. Recommended for thinning and felling in some pocket of the sub-compartment.													
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	1011	13	97	9939											
	Firewood	659	9		6118											
30-49	Cham	1799	23	64	1562											
	Firewood	1102	14		924											
20-29	Tsim	3961	51	55	1505											
	Firewood	2868	37		883											
10-19	Poles, etc.	2276	30	20	268											
	Firewood	1517	20		114											
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	3.4	4%														
Thinning	13.4	17%														
Felling	26.8	35%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																
Geog	Sakteng	Comp.	9Benangtse	Sub-Comp.	Namthengtse	No.	9E									
Areas in ha																
Non Forest Area	41.4	Protection	2.7	In-operable	22.3	Production	39.6									
Forest Composition and Description																
Mixed H/C stand with open canopy coverage. The area was mostly grazed by the cattle.						Stand data										
						Bas. Area (m2/ha)	13.8									
						Tot. Vol. (m3/ha)	84.1									
						Vconifer %	16%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood	13	56				
						Spruce		Coppice		Bamboo	19	38				
						Mixed Conifer	19	Canopy	%	Cane						
						Blue Pine		Dense	13	Daphne	38	6				
						Chir Pine		Closed	13							
						Hardwood	13	Open	69							
						Mixed H/C	69	Unstocked	6	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	50	Good	6	Grazing	31	50				
						Immature	38	Average	81	Shokshing						
						Mature	13	Poor	13	Lopping	25	44				
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	13	Stable	38	High	19											
Moderate	50	Moderate	44	Moderate	63											
Steep	38	Unstable	19	Low	19											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.																
Exbucklandia																
Litsea spp.																
Michelia spp.																
Persea spp.																
Quercus spp.	88	66	7	15	14	2						38	12			
Schima spp.																
Walnut																
Other Broadleave	155	221	120	74	14	5	2	1	0			216	68			
Conifer spp.	221	199	35	15	10		1					62	19			
Total	464	486	163	104	39	6	2	1	0			316	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Improvement (regeneration).														
	Improvement	√														
	Timber Use															
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)					No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 50	Drashing			15												
	Firewood	21	1		46											
30-49	Cham	309	8	47	195											
	Firewood	536	14		479											
20-29	Tsim	202	5	24	52											
	Firewood	807	20		231											
10-19	Poles, etc.			4												
	Firewood	280	7		23											
Silvicultural Measures					Area in ha implemented per year										Total	%
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting	7.4	19%														
Thinning																
Felling																
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																	
Geog	Sakteng	Comp.	9Benangtse	Sub-Comp.	Kenphutse	No.	9F										
Areas in ha																	
Non Forest Area	21.0	Protection	3.2	In-operable	37.8	Production	48.2										
Forest Composition and Description																	
Mixed H/C forest with age class ranging from young to mature.						Stand data											
						Bas. Area (m2/ha)	24.1										
						Volume (m3/ha)	422.5										
						Volume conifer %	73%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir		Natural	100	Firewood	7	79					
						Spruce		Coppice		Bamboo	71	21					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense	7	Daphne	29	21					
						Chir Pine		Closed	43								
						Hardwood		Open	50								
						Mixed H/C	100	Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	7	Good	29	Grazing	36	21					
						Immature	21	Average	71	Shokshing							
						Mature	71	Poor		Lopping	14	7.1					
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
						Gentle	7	Stable	43	High	43						
						Moderate	43	Moderate	57	Moderate	57						
						Steep	50	Unstable		Low							
Species	Height	N/ha per diameter class										Total (> 10cm)					
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock																	
Spruce																	
Fir	379	51	16	3		1	1	1	0	1	18	41	8				
Other Conifers	51				4					1	11	16	3				
Oak				6	1							7	1				
Acer																	
Betula			16	3	3	3		1	0			26	5				
Rhododendron	1263	556	170	102	22	7	2					303	59				
Other Broadleaves	1490	1112	65	38	13	4	3	0	0			123	24				
Total	3183	1718	267	151	45	14	6	3	1	1	29	517	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Timber and firewood recommended based on felling and thinning.															
	Improvement																
	Timber Use	√															
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	644	13	57	5936												
	Firewood	456	9		2610												
30-49	Cham	43	1	42	66												
	Firewood	1161	24		889												
20-29	Tsim	140	3	37	46												
	Firewood	2523	52		616												
10-19	Poles, etc.			9													
	Firewood	1168	24		78												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	20.6	43%															
Felling	20.6	43%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	9Benangtse	Sub-Comp.	Prabo	No.	9G										
Areas in ha																	
Non Forest Area	7.1	Protection	9.7	In-operable	29.7	Production	52.9										
Forest Composition and Description																	
Mixed H/C stand with mostly open canopy coverage.						Stand data											
						Bas. Area (m2/ha)		10.8									
						Tot. Vol. (m3/ha)		111.2									
		Vconifer %		5%													
<p>Number of trees/ha by diameter class (dbh>10 cm)</p> <p>Legend:</p> <ul style="list-style-type: none"> Conifer spp. Schima spp. Michelia spp. Cinnamomum spp. Other Broadleave Quercus spp. Litsea spp. Beilschmiedia spp. Walnut Persea spp. Exbucklandia 						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir		Natural	100	Firewood	19	75					
						Spruce		Coppice		Bamboo		13					
						Mixed Conifer	6	Canopy	%	Cane							
						Blue Pine		Dense	13	Daphne	25	50					
						Chir Pine		Closed	38								
						Hardwood		Open	50								
						Mixed H/C	94	Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	13	Good	13	Grazing	19	69					
						Immature	13	Average	6	Shokshing							
						Mature	63	Poor	81	Lopping	31	50					
						Overmature	13	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	% %						
Gentle	13	Stable	13	High	13												
Moderate	38	Moderate	63	Moderate	63												
Steep	50	Unstable	25	Low	25												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Beilschmiedia spp.																	
Cinnamomum spp.				5								5	3				
Exbucklandia																	
Litsea spp.			7									7	4				
Michelia spp.																	
Persea spp.	22				4	5	3	0				12	6				
Quercus spp.			7	3	4	5	5	2	1	0	2	28	16				
Schima spp.		44															
Walnut																	
Other Broadleave	818	287	78	28	9						1	116	64				
Conifer spp.	44	22		10		2						13	7				
Total	884	354	92	46	17	12	7	3	1	0	2	180	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Recommended to fell the trees in densed canopy to encourage the regeneration.															
	Improvement																
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	% (m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
>50	Drashing	113	2	62	600												
	Firewood	330	6		1964												
30-49	Cham	152	3	58	167												
	Firewood	732	14		836												
20-29	Tsim	135	3	61	31												
	Firewood	1346	25		369												
10-19	Poles, etc.			46													
	Firewood	2244	42		162												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning																	
Felling	33.0	63%															
Assessment carried out by		SWS											Year:	2019			

Sub-Compartment Record																	
Geog	Sakteng	Comp.	10Jabkangbro	Sub-Comp.	Jabkangbro	No.	10A										
Areas in ha																	
Non Forest Area	13.1	Protection	8.2	In-operable	25.9	Production	55.1										
Forest Composition and Description																	
Hemlock and Mixed H/C stand with few blue pine stands. The area has mostly open canopy coverage.						Stand data											
						Bas. Area (m2/ha)	25.4										
						Volume (m3/ha)	230.9										
						Volume conifer %	56%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock	41	Plantation		Type	%	%					
						Fir		Natural	100	Firewood	6	94					
						Spruce		Coppice		Bamboo	65	24					
						Mixed Conifer		Canopy		Cane							
						Blue Pine	18	Dense	29	Daphne		88					
						Chir Pine		Closed	18								
						Hardwood		Open	41								
						Mixed H/C	41	Unstocked	12	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	29	Good	35	Grazing	29	71					
						Immature	53	Average	53	Shokshing							
						Mature	12	Poor	12	Lopping	47	5.9					
						Overmature	6	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	29	Stable	12	High													
Moderate	12	Moderate	65	Moderate	88												
Steep	59	Unstable	24	Low	12												
N/ha per diameter class																	
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine	21	62	20	5	5	6	3		1	0		40	12				
Hemlock	187	229	33	19	23	16	5	1			3	101	30				
Spruce																	
Fir																	
Other Conifers																	
Oak		21	7		1							8	2				
Acer	21	21	7	5	6	6	2	1				27	8				
Betula			13	7	9	5	3	1	1			38	11				
Rhododendron	229	270	40	29	12	2	1	1	0			86	25				
Other Broadleaves	250	333	13	10	9	5	2	1				40	12				
Total	707	936	133	74	65	41	18	5	1	0	3	340	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Felling recommended.														
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	601	11	61	1638												
	Firewood	303	6		719												
30-49	Cham	1947	35	41	2040												
	Firewood	434	8		541												
20-29	Tsim																
	Firewood																
10-19	Poles, etc.																
	Firewood																
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning																	
Felling	45.4	82%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	10Jabkangbro	Sub-Comp.	Tshedangtse	No.	10B										
Areas in ha																	
Non Forest Area	2.2	Protection	10.5	In-operable	57.5	Production	27.1										
Forest Composition and Description																	
Mixed H/C stand with mostly closed canopy coverage.						Stand data											
						Bas. Area (m2/ha)	112.0										
						Volume (m3/ha)	2345.4										
						Volume conifer %	83%										
<p>Number of trees/ha by diameter class (dbh>10cm)</p> <p>Legend:</p> <ul style="list-style-type: none"> Other Broadleaves Rhododendron Betula Acer Oak Other Conifers Fir Spruce Hemlock Bluepine Chirpine 						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Firewood	13	75					
						Fir		Natural	100	Bamboo	38	38					
						Spruce		Coppice		Cane							
						Mixed Conifer		Canopy	%	Daphne	13	63					
						Blue Pine		Dense									
						Chir Pine		Closed	63								
						Hardwood		Open	38								
						Mixed H/C	100	Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good	88	Grazing	38	38					
						Immature	13	Average	13	Shokshing							
						Mature	88	Poor		Lopping							
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle	25	Stable	88	High													
Moderate	50	Moderate	13	Moderate	88												
Steep	25	Unstable		Low	13												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine				15	10	9	6	8	2	0		52	3				
Hemlock					5	3	1	7	5	3	22	45	3				
Spruce																	
Fir	1813	398		5	8	8	4	14	10	12	122	182	11				
Other Conifers	44	221	28	5		3		2	2	0	5	45	3				
Oak			14		10		1					26	2				
Acer			71	51	5	3	1	2				133	8				
Betula			71	36	23	13	1	10	7	0		161	10				
Rhododendron	4907	6499	538	188	31	17		5	2		2	783	47				
Other Broadleaves			141	81	18	6	2	3		1		253	15				
Total	6764	7118	863	382	112	63	17	50	28	17	151	1682	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	<input type="checkbox"/>	Felling of matured and over matured tree is recommended.														
	Improvement	<input type="checkbox"/>															
	Timber Use	<input checked="" type="checkbox"/>															
	Firewood Use	<input checked="" type="checkbox"/>															
	Silvopasture	<input type="checkbox"/>															
Sokshing	<input type="checkbox"/>																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	3048	113	63	24789												
	Firewood	1408	52		9476												
30-49	Cham	128	5	37	191												
	Firewood	1608	59		1363												
20-29	Tsim	138	5	17	56												
	Firewood	1655	61		429												
10-19	Poles, etc.			10													
	Firewood	2298	85		166												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	10.2	38%															
Felling	16.9	63%															
Assessment carried out by				SWS										Year:	2019		

Annexure 16: Compiled Results by Compartment for Joenkhar FMA

Area Distribution, Basal Area and No. of Sample Plots for Forest Management Area: **Joenkhar**

Comp	Sub-Compartment		Area Distribution (ha)					BA (m ² /ha)	No. of Plots
	No.	Name	Non Forest Area	Protection	Inoperable	Production	Total		
1	a	Baethangtse	1.2	5.2	22.6	33.9	62.9	9.1	15
1	b	Zhibreng	1.7	5.7	34.4	23	64.8	12.4	10
1	c	Pangzhungjab	11.4	16.2	58.7	39.2	125.5	17.4	10
1	d	Tshengyem	21	1.9	23.7	42	88.6	16.4	16
1	e	Sonapang	24.1	3.7	23.2	34.7	85.7	9.3	15
2	a	Tsemorong	6.8	2.2	15.6	81.8	106.4	17.5	21
2	b	Tsemobarma	10.5	1.3	27.5	70.8	110.1	14.1	18
2	c	Broksarbo	2.8	1.9	11.6	85.2	101.5	15.5	22
2	d	Nyugde	11.2	3.6	22.9	72.6	110.3	15.5	19
2	e	Tsemotse	0.9	7.1	7	80.8	95.8	11.3	23
2	f	Tsemotsejuk	1.5	9.5		93.3	104.3	11	25
2	g	Bronma	10.9	6.6	41.8	1.7	61	18	1
2	h	Tshebdi	3.1	6	48.9	38.4	96.4	15.5	11
2	i	Nathengtse	10.4	1.2	31.4	55.8	98.8	7.6	16
3	a	Taksarjuk	7.2	3.6	25	64.4	100.2	14.9	18
3	b	Tholong-Mangdina	16.6	2.2	24.8	52.8	96.4	22	17
3	c	Mangdinatse	0.4	0.4	2.4	57.8	61	9.8	24
3	d	Bronmatse	16.6	26.6	73.5	3.1	119.8	16	1
3	e	Nathengjuk	9.8	20	47	22.1	98.9	16	8
3	f	Nyakshithe	7.9	19	64.9	12.4	104.2	17.5	4
3	g	Natheng	8.1	5.3	75.7	6.6	95.7	17	2
3	h	Tshorphurong	23.2	4.5	28.8	13.6	70.1	2.5	8
4	a	Kherilok	5.1	10.5	22.2	70.1	107.9	23.3	19
4	b	Brayteng	1.2	1.3	39.8	59.7	102	15.5	15
4	c	Najab	1.7	6.8	54.9	36.6	100	23	10
4	d	Najabjuk	3.6	1.5	33.9	60.2	99.2	22.1	16
4	e	Nukteng		6.8	84.6	7.4	98.8	4	2
4	f	Nugmanang	0.4	5	46.1	50	101.5	27.8	13
4	h	Tshonang	1.3	7.7	48.5	27.3	84.8	9.8	9
5	a	Moelamthung	3.1	4.7	71.7	22.6	102.1	11	6
5	b	Tshoiteng	1	7.7	17.7	71	97.4	36.7	20
5	c	Pokshing	3.9	3	56.8	26.7	90.4	10.5	8
5	d	Barma	8.9	1.8	21.8	68.9	101.4	13.9	19
5	e	Barmatse		4.9	32.7	58	95.6	34.1	16

Comp	Sub-Compartment		Area Distribution (ha)					BA (m ² /ha)	No. of Plots
	No.	Name	Non Forest Area	Protection	Inoperable	Production	Total		
1		Zhibreng-Tshengyem	59.4	32.7	162.6	172.8	427.5	13.2	66
2		Tsemorong-Tsemotse	58.1	39.4	206.7	580.4	884.6	13.6	156
3		Taksarjuk-Tshorphurong	89.8	81.6	342.1	232.8	746.3	14.8	82
4		Kherilok-Tshonang	13.3	39.6	330	311.3	694.2	20.6	84
5		Moelamthung-Barmatse	16.9	22.1	200.7	247.2	486.9	24.6	69
Total			237.5	215.4	1242.1	1544.5	3239.5	16.9	457

Stand Data of Forest Management Area: Joenkhar

Comp	Sub-Compartment		Production area	Basal Area	Volume	Tot. Volume	V conifer
No.	No.	Name	(ha)	(m2/ha)	(m3/ha)	(m3)	(%)
1	a	Baethangtse	33.9	9.1	52.4	1776.4	16.0
1	b	Zhibreng	23.0	12.4	91.9	2113.7	28.0
1	c	Pangzhungjab	39.2	17.4	114.4	4484.5	10.0
1	d	Tshengyem	42.0	16.4	122.7	5153.4	36.0
1	e	Sonapang	34.7	9.3	66.6	2311.0	19.0
2	a	Tsemorong	81.8	17.5	123.6	10110.5	0.0
2	b	Tsemobarma	70.8	14.1	259.2	18351.4	0.0
2	c	Broksarbo	85.2	15.5	308.0	26241.6	0.0
2	d	Nyugde	72.6	15.5	242.0	17569.2	16.0
2	e	Tsemotse	80.8	11.3	74.0	5979.2	49.0
2	f	Tsemotsejuk	93.3	11.0	109.3	10197.7	50.0
2	g	Bronma	1.7	18.0	118.7	201.8	100.0
2	h	Tshebdi	38.4	15.5	114.1	4381.4	93.0
2	i	Nathengtse	55.8	7.6	57.4	3202.9	12.0
3	a	Taksarjuk	64.4	14.9	75.2	4842.9	1.0
3	b	Tholong-Mangdina	52.8	22.0	238.2	12577.0	0.0
3	c	Mangdinatse	57.8	9.8	125.3	7242.3	0.0
3	d	Bronmatse	3.1	16.0	124.4	385.6	79.0
3	e	Nathengjuk	22.1	16.0	109.1	2411.1	72.0
3	f	Nyakshithe	12.4	17.5	121.5	1506.6	57.0
3	g	Natheng	6.6	17.0	116.3	767.6	78.0
3	h	Tshorphurong	13.6	2.5	15.6	212.2	73.0
4	a	Kherilok	70.1	23.3	560.9	39319.1	0.0
4	b	Brayteng	59.7	15.5	225.5	13462.4	0.0
4	c	Najab	36.6	23.0	301.8	11045.9	0.0
4	d	Najabjuk	60.2	22.1	211.7	12744.3	14.0
4	e	Nukteng	7.4	4.0	28.1	207.9	0.0
4	f	Nugmanang	50.0	27.8	198.0	9900.0	9.0
4	h	Tshonang	27.3	9.8	54.1	1476.9	0.0
5	a	Moelamthung	22.6	11.0	64.4	1455.4	0.0
5	b	Tshoiteng	71.0	36.7	580.0	41180.0	0.0
5	c	Pokshing	26.7	10.5	67.6	1804.9	2.0
5	d	Barma	68.9	13.9	373.7	25747.9	0.0
5	e	Barmatoe	58.0	34.1	271.0	15718.0	0.0

Compartment		Production area	Basal Area	Volume	Tot. Volume	V conifer
		(ha)	(m2/ha)	(m3/ha)	(m3)	(%)
1	Zhibreng-Tshengyem	172.8	13.2	91.7	15839.0	21.7
2	Tsemorong-Tsemotse	580.4	13.6	165.8	96235.7	24.5
3	Taksarjuk-Tshorphurong	232.8	14.8	128.6	29945.3	17.7
4	Kherilok-Tshonang	311.3	20.6	283.2	88156.5	4.2
5	Moelamthung-Barmatoe	247.2	24.6	347.5	85906.3	0.2
Total		1544.5	16.9	204.7	316082.7	15.2

Forest Type Distribution in Forest Management Area of: Joenkhar

Comp	Sub-Compartment		Prod. Area (ha)	Forest Type Distribution (in ha)								
	No.	Name		Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total
1	a	Baethangtse	33.9							33.9		
1	b	Zhibreng	23							20.7	2.3	
1	c	Pangzhungjab	39.2							39.2		15.7
1	d	Tshengyem	42							10.5	31.5	
1	e	Sonapang	34.7							30.2	4.5	
2	a	Tsemorong	81.8							81.8		
2	b	Tsemobarma	70.8							66.6	4.2	
2	c	Broksarbo	85.2							85.2		
2	d	Nyugde	72.6							72.6		8.0
2	e	Tsemotse	80.8		59.8					21.0		
2	f	Tsemotsejuk	93.3		44.8		14.9			33.6		
2	g	Bronma	1.7				1.7					
2	h	Tshebdi	38.4		3.5		28.0				6.9	10.4
2	i	Nathengtse	55.8		17.3					38.5		3.3
3	a	Taksarjuk	64.4							60.5	3.9	18.0
3	b	Tholong-Mangdina	52.8							52.8		6.3
3	c	Mangdinatse	57.8							57.8		14.5
3	d	Bronmatse	3.1							3.1		
3	e	Nathengjuk	22.1		2.9		2.9				16.6	5.5
3	f	Nyakshithe	12.4	3.1							9.3	
3	g	Natheng	6.6				3.3				3.3	
3	h	Tshorphurong	13.6				8.6	5.2				3.4
4	a	Kherilok	70.1							70.1		
4	b	Brayteng	59.7							7.8	51.9	
4	c	Najab	36.6							7.3	29.3	
4	d	Najabjuk	60.2							45.2	15.1	
4	e	Nukteng	7.4							7.4		
4	f	Nugmanang	50							38.5	11.5	
4	h	Tshonang	27.3							24.3	3.0	
5	a	Moelamthung	22.6							22.6		
5	b	Tshoiteng	71							71.0		
5	c	Pokshing	26.7							20.0	6.7	
5	d	Barma	68.9							68.9		
5	e	Barmatse	58							58.0		

Compartment	Prod. Area (ha)	Forest Type Distribution (in ha)									
		Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total	
1 Zhibreng-Tshengyem	172.8							78%	22%	100%	
2 Tsemorong-Tsemotse	580.4		22%		8%			69%	2%	100%	
3 Taksarjuk-Tshorphurong	232.8	1%	1%		6%	2%		75%	14%	100%	
4 Kherilok-Tshonang	311.3							64%	36%	100%	
5 Moelamthung-Barmatse	247.2							97%	3%	100%	
Total	1544.5	0%	8%		4%	0%		74%	13%	100%	

Canopy Closure and Condition of Forest Management Area of: Joenkhar

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Canopy closure (ha)					Condition (ha)			
			dense	closed	open	unstocked	Total	good	average	poor	Total
1	a Baethangtse	33.9		29.5	4.4		33.9	4.4	29.5		33.9
1	b Zhibreng	23	2.3	13.8	6.9		23.0		23.0		23.0
1	c Pangzhungjab	39.2		39.2			39.2	15.7	23.5		39.2
1	d Tshengyem	42		37.0	5.5		42.4	2.5	39.5		42.0
1	e Sonapang	34.7		25.3	9.4		34.7		32.3	2.4	34.7
2	a Tsemorong	81.8	4.1	58.1	19.6		81.8	4.1	77.7		81.8
2	b Tsemobarma	70.8	7.8	58.8	4.2		70.8	7.8	63.0		70.8
2	c Broksarbo	85.2		80.9	4.3		85.2	23.0	62.2		85.2
2	d Nyugde	72.6		49.4	18.9	3.6	71.9	15.2	42.1	15.2	72.6
2	e Tsemotse	80.8		59.8	13.7	7.3	80.8	17.8	56.6	7.3	81.6
2	f Tsemotsejuk	93.3		59.7	33.6		93.3	14.9	70.9	7.5	93.3
2	g Bronma	1.7			1.7		1.7		1.7		1.7
2	h Tshedi	38.4		17.3	21.1		38.4	6.9	28.0	3.5	38.4
2	i Nathengtse	55.8	7.3	31.2	17.3		55.8	3.3	49.1	3.3	55.8
3	a Taksarjuk	64.4	28.3	7.1	18.0	10.9	64.4	21.3	39.3	3.9	64.4
3	b Tholong-Mangdir	52.8	3.2	31.2	15.3	3.2	52.8	12.7	31.2	9.5	53.3
3	c Mangdinatse	57.8	12.1	14.5	22.0	9.8	58.4	19.1	31.2	7.5	57.8
3	d Bronmatse	3.1		3.1			3.1		3.1		3.1
3	e Nathengjuk	22.1	8.4	5.5	2.9	5.5	22.3	5.5	8.4	8.4	22.3
3	f Nyakshithe	12.4		6.2	6.2		12.4		6.2	6.2	12.4
3	g Natheng	6.6		3.3		3.3	6.6		6.6		6.6
3	h Tshorphurong	13.6		1.8	6.8	5.2	13.7		8.6	5.2	13.7
4	a Kherilok	70.1	66.6	3.5			70.1	70.1			70.1
4	b Brayteng	59.7		16.1	23.9	19.7	59.7	16.1	31.6	11.9	59.7
4	c Najab	36.6	3.7	7.3	7.3	18.3	36.6	7.3	18.3	11.0	36.6
4	d Najabjuk	60.2	18.7	30.1	11.4		60.2	48.8	11.4		60.2
4	e Nukteng	7.4				7.4	7.4			7.4	7.4
4	f Nugmanang	50	11.5	7.5	31.0		50.0	11.5	38.5		50.0
4	h Tshonang	27.3		3.0	21.3	3.0	27.3		21.3	6.0	27.3
5	a Moelamthung	22.6		7.5	11.3	3.8	22.6		22.6		22.6
5	b Tshoiteng	71	28.4	42.6			71.0	53.3	17.8		71.0
5	c Pokshing	26.7		10.1	16.8		27.0		26.7		26.7
5	d Barma	68.9		22.0	28.9	17.9	68.9	25.5	36.5	7.6	69.6
5	e Barmatse	58	14.5	25.5	18.0		58.0	32.5	25.5		58.0

Compartment	Prod. Area (ha)	Canopy closure (ha)					Condition (ha)			
		dense	closed	open	unstocked	Total	good	average	poor	Total
1 Zhibreng-Tshengyem	172.8	1%	84%	15%		100%	13%	86%	1%	100%
2 Tsemorong-Tsemotse	580.4	3%	72%	23%	2%	100%	16%	78%	6%	100%
3 Taksarjuk-Tshorphurong	232.8	22%	31%	31%	16%	100%	25%	58%	17%	100%
4 Kherilok-Tshonang	311.3	32%	22%	30%	16%	100%	49%	39%	12%	100%
5 Moelamthung-Barmatse	247.2	17%	44%	30%	9%	100%	45%	52%	3%	100%
Total	1544.5	14%	52%	26%	8%	100%	28%	64%	8%	100%

Age Distribution and Stand Types in Forest Management Area of: Joenkhar

Comp No.	Sub-Compartment		Prod. Area (ha)	Age distribution					Stand type distribution			
	No.	Name		young	immature	mature	overmature	Total	plantation	natural	coopice	Total
1	a	Baethangtse	33.9		13.6	20.3		33.9		33.9		33.9
1	b	Zhibreng	23		4.6	16.1	2.3	23.0		23.0		23.0
1	c	Pangzhungjab	39.2	15.7	15.7	7.8		39.2		39.2		39.2
1	d	Tshengyem	42		8.0	29.0	5.5	42.4		42.0		42.0
1	e	Sonapang	34.7		4.5	23.2	6.9	34.7		34.7		34.7
2	a	Tsemorong	81.8		4.1	77.7		81.8		81.8		81.8
2	b	Tsemobarma	70.8		4.2	47.4	19.8	71.5		70.8		70.8
2	c	Broksarbo	85.2		7.7	65.6	11.9	85.2		85.2		85.2
2	d	Nyugde	72.6	8.0	18.9	42.1	3.6	72.6		72.6		72.6
2	e	Tsemotse	80.8		13.7	63.0	3.2	80.0		80.8		80.8
2	f	Tsemotsejuk	93.3		11.2	70.9	11.2	93.3		93.3		93.3
2	g	Bronma	1.7			1.7		1.7		1.7		1.7
2	h	Tshebdi	38.4	10.4	3.5	21.1	3.5	38.4		38.4		38.4
2	i	Nathengtse	55.8	3.3	3.3	49.1		55.8		55.8		55.8
3	a	Taksarjuk	64.4	18.0	14.2	32.2		64.4		64.4		64.4
3	b	Tholong-Mangdir	52.8	6.3	6.3	40.1		52.8		52.8		52.8
3	c	Mangdinatse	57.8	14.5	16.8	16.8	9.8	57.8		57.8		57.8
3	d	Bronmatse	3.1			3.1		3.1		3.1		3.1
3	e	Nathengjuk	22.1	5.5	5.5	8.4	2.9	22.3		22.1		22.1
3	f	Nyakshithe	12.4			12.4		12.4		12.4		12.4
3	g	Natheng	6.6		3.3	3.3		6.6		6.6		6.6
3	h	Tshorphurong	13.6	3.4	8.6	1.8		13.7		13.6		13.6
4	a	Kherilok	70.1			70.1		70.1		70.1		70.1
4	b	Brayteng	59.7			59.7		59.7		59.7		59.7
4	c	Najab	36.6		11.0	25.6		36.6		36.6		36.6
4	d	Najabjuk	60.2		22.9	37.9		60.8		60.2		60.2
4	e	Nukteng	7.4			7.4		7.4		7.4		7.4
4	f	Nugmanang	50		11.5	38.5		50.0		50.0		50.0
4	h	Tshonang	27.3		9.0	18.3		27.3		27.3		27.3
5	a	Moelamthung	22.6		18.8	3.8		22.6		22.6		22.6
5	b	Tshoiteng	71		17.8	53.3		71.0		71.0		71.0
5	c	Pokshing	26.7		26.7			26.7		26.7		26.7
5	d	Barma	68.9		3.4	65.5		68.9		68.9		68.9
5	e	Barmatoe	58			58.0		58.0		58.0		58.0

Compartment	Prod. Area (ha)	Age distribution					Stand type distribution				
		young	immature	mature	overmature	Total	plantation	natural	coopice	Total	
1	Zhibreng-Tshengyem	172.8	9%	27%	56%	9%	100%		100%		100%
2	Tsemorong-Tsemotse	580.4	4%	11%	76%	9%	100%		100%		100%
3	Taksarjuk-Tshorphurong	232.8	21%	23%	51%	5%	100%		100%		100%
4	Kherilok-Tshonang	311.3		17%	83%		100%		100%		100%
5	Moelamthung-Barmatoe	247.2		27%	73%		100%		100%		100%
Total	1544.5	6%	19%	71%	5%	100%		100%		100%	

Forest Management Area of: Joenkhar

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Slope (in ha)			Erosiveness (in ha)			Soil Cover (in ha)		
			gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
1	a Baethangtse	33.9	2.4	13.6	18.0	11.2	22.7		4.4	24.7	4.4
1	b Zhibreng	23	2.3	13.8	6.9		20.7	2.3	2.3	20.7	
1	c Pangzhungjab	39.2	15.7	7.8	15.7	23.5	15.7			39.2	
1	d Tshengyem	42	2.5	21.0	18.5	10.5	26.5	5.5	5.5	34.0	2.5
1	e Sonapang	34.7	9.4	18.4	6.9	2.4	30.2	2.4		30.2	4.5
2	a Tsemorong	81.8		39.3	42.5	46.6	35.2		4.1	58.1	19.6
2	b Tsemobarma	70.8	19.8	27.6	23.4	27.6	43.2		7.8	58.8	4.2
2	c Broksarbo	85.2	23.0	50.3	11.9	27.3	57.9		7.7	77.5	
2	d Nyugde	72.6	18.9	34.1	18.9	30.5	34.1	8.0	18.9	42.1	11.6
2	e Tsemotse	80.8	3.2	17.8	59.8	38.8	38.8	3.2	7.3	59.8	13.7
2	f Tsemotsejuk	93.3		33.6	59.7	14.9	78.4		3.7	78.4	11.2
2	g Bronma	1.7		1.7			1.7			1.7	
2	h Tshbedi	38.4	6.9	28.0	3.5		34.9	3.5	6.9	28.0	3.5
2	i Nathengtse	55.8		38.5	17.3	21.2	35.2			38.5	17.3
3	a Taksarjuk	64.4	21.3	25.1	18.0	21.3	32.2	10.9	7.1	53.5	3.9
3	b Tholong-Mangdi	52.8	12.7	15.3	24.8	24.8	18.5	9.5	3.2	46.5	3.2
3	c Mangdinatse	57.8	24.3	24.3	9.8	19.1	28.9	9.8	4.6	45.7	7.5
3	d Bronmatse	3.1	3.1				3.1			3.1	
3	e Nathengjuk	22.1		13.9	8.4	2.9	8.4	11.1	5.5	11.1	5.5
3	f Nyakshithe	12.4		9.3	3.1	3.1	9.3			12.4	
3	g Natheng	6.6	3.3	3.3		3.3	3.3			6.6	
3	h Tshorphurong	13.6	3.4	6.8	3.4	3.4	6.8	3.4		8.6	5.2
4	a Kherilok	70.1	11.2	40.7	18.2	37.2	32.9		70.1		
4	b Brayteng	59.7	19.7	19.7	19.7	40.0	19.7		11.9	40.0	7.8
4	c Najab	36.6	7.3	14.6	14.6	7.3	29.3		11.0	25.6	
4	d Najabjuk	60.2	11.4	48.8		33.7	26.5		30.1	30.1	
4	e Nukteng	7.4			7.4			7.4			7.4
4	f Nugmanang	50	11.5	38.5		11.5	38.5		31.0	19.0	
4	h Tshonang	27.3	6.0	12.0	9.0	9.0	18.3			12.0	15.3
5	a Moelamthung	22.6			22.6		22.6		3.8	18.8	
5	b Tshoiteng	71	17.8	53.3		35.5	35.5		53.3	17.8	
5	c Pokshing	26.7		13.4	13.4		20.0	6.7		26.7	
5	d Barma	68.9	3.4	25.5	40.0	32.4	36.5		40.0	28.9	
5	e Barmatse	58	29.0	29.0		14.5	43.5		22.0	32.5	

Compartment	Prod. Area (ha)	Slope (in ha)			Erosiveness (in ha)			Soil Cover (in ha)		
		gentle	moderate	steep	stable	moderate	unstable	high	moderate	low
1 Zhibreng-Tshengyem	172.8	19%	43%	38%	28%	67%	6%	7%	86%	7%
2 Tsemorong-Tsemotse	580.4	12%	47%	41%	36%	62%	3%	10%	76%	14%
3 Taksarjuk-Tshorphurong	232.8	29%	42%	29%	33%	47%	19%	9%	80%	11%
4 Kherilok-Tshonang	311.3	22%	56%	22%	45%	53%	2%	50%	41%	10%
5 Moelamthung-Barmat	247.2	20%	49%	31%	33%	64%	3%	48%	50%	
Total	1544.5	19%	48%	33%	36%	59%	5%	23%	67%	10%

Distribution of Management Options for Forest Management Area of: **Joenkhar**

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Management Option (in ha)					
			No activity	Improvement	Timber	Firewood	Silvopast.	Shokshing
1	a Baethangtse	33.9	0.0	27.1	0.0	6.8	0.0	0.0
1	b Zhibreng	23	0.0	4.6	18.4	0.0	0.0	0.0
1	c Pangzhungjab	39.2	0.0	0.0	0.0	39.2	0.0	0.0
1	d Tshengyem	42	0.0	2.6	18.4	21.0	0.0	0.0
1	e Sonapang	34.7	0.0	2.3	0.0	32.4	0.0	0.0
2	a Tsemorong	81.8	0.0	19.5	0.0	0.0	0.0	0.0
2	b Tsemobarma	70.8	0.0	70.8	0.0	0.0	0.0	0.0
2	c Broksarbo	85.2	0.0	58.1	0.0	27.1	0.0	0.0
2	d Nyugde	72.6	0.0	57.3	0.0	15.3	0.0	0.0
2	e Tsemotse	80.8	0.0	70.2	10.5	0.0	0.0	0.0
2	f Tsemotsejuk	93.3	0.0	11.2	82.1	0.0	0.0	0.0
2	g Bronma	1.7	60.9	0.0	0.0	0.0	0.0	0.0
2	h Tshbedi	38.4	0.0	38.4	0.0	0.0	0.0	0.0
2	i Nathengtse	55.8	98.8	0.0	0.0	0.0	0.0	0.0
3	a Taksarjuk	64.4	0.0	50.1	0.0	0.0	0.0	0.0
3	b Tholong-Mangdina	52.8	0.0	0.0	21.7	15.5	0.0	0.0
3	c Mangdinatse	57.8	0.0	9.6	0.0	24.1	0.0	0.0
3	d Bronmatse	3.1	0.0	3.1	0.0	0.0	0.0	0.0
3	e Nathengjuk	22.1	0.0	0.0	16.6	0.0	0.0	0.0
3	f Nyakshithe	12.4	0.0	0.0	0.0	3.1	0.0	0.0
3	g Natheng	6.6	95.7	0.0	0.0	0.0	0.0	0.0
3	h Tshorphurong	13.6	70.1	0.0	0.0	0.0	0.0	0.0
4	a Kherilok	70.1	0.0	0.0	36.9	33.2	0.0	0.0
4	b Brayteng	59.7	0.0	0.0	11.9	15.9	0.0	0.0
4	c Najab	36.6	0.0	0.0	7.3	3.7	0.0	0.0
4	d Najabjuk	60.2	0.0	0.0	0.0	60.2	0.0	0.0
4	e Nukteng	7.4	0.0	3.7	0.0	0.0	0.0	0.0
4	f Nugmanang	50	0.0	0.0	0.0	50.0	0.0	0.0
4	h Tshonang	27.3	0.0	0.0	0.0	3.0	0.0	0.0
5	a Moelamthung	22.6	0.0	0.0	0.0	7.5	0.0	0.0
5	b Tshoiteng	71	0.0	0.0	35.5	35.5	0.0	0.0
5	c Pokshing	26.7	90.4	0.0	0.0	0.0	0.0	0.0
5	d Barma	68.9	0.0	7.3	0.0	0.0	0.0	0.0
5	e Barmatoe	58	0.0	0.0	36.3	21.8	0.0	0.0

Compartment	Prod. Area (ha)	Management Option (in ha)					
		No activity	Improvement	Timber	Firewood	Silvopast.	Shokshing
1 Zhibreng-Tshengyem	172.8	0.0	36.6	36.8	99.4	0.0	0.0
2 Tsemorong-Tsemotse	580.4	159.7	325.5	92.6	42.4	0.0	0.0
3 Taksarjuk-Tshorphurong	232.8	165.8	62.8	38.3	42.7	0.0	0.0
4 Kherilok-Tshonang	311.3	0.0	3.7	56.1	166.0	0.0	0.0
5 Moelamthung-Barmatoe	247.2	90.4	7.3	71.8	64.8	0.0	0.0
Total	1544.5	415.9	435.9	295.6	415.3	0.0	0.0

Production Potential of Forest Management Area: Joenkhar

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	Volume (m3/ha)	harv. Volume (m3/ha)	Extract. Rate	Timber (Total Volume m3)				Firewood (Total Volume m3)			
						Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1	a Baethangtse	33.9	52.4	1759.0	99.0%	0	178	71	79	112	503	457	359
1	b Zhibreng	23.0	91.9	1596.0	75.5%	263	275	80	59	292	432	177	18
1	c Pangzhungjab	39.2	114.4	4263.0	95.1%	144	162	0	0	960	1190	826	981
1	d Tshengyem	42.0	122.7	4250.0	82.5%	1129	641	326	170	1052	627	93	212
1	e Sonapang	34.7	66.6	1499.0	64.9%	220	91	97	30	204	488	0	369
2	a Tsemorong	81.8	123.6	9756.0	96.5%	0	280	129	31	1720	4491	1754	1351
2	b Tsemobarma	70.8	259.2	28614.0	155.9%	143	389	174	250	10813	15656	559	630
2	c Broksarbo	85.2	308.0	24518.0	93.4%	0	116	141	0	20462	2417	788	594
2	d Nyugde	72.6	242.0	16964.0	96.6%	0	233	259	0	13300	1534	970	668
2	e Tsemotse	80.8	74.0	5695.0	95.2%	0	972	185	68	997	2467	420	586
2	f Tsemotsejuk	93.3	109.3	7021.0	68.8%	206	1311	240	72	1766	2358	742	326
2	g Bronma	1.7	118.7	126.0	62.4%	0	47	20	0	0	0	59	0
2	h Tshbedi	38.4	114.1	4037.0	92.1%	69	941	690	607	325	801	300	304
2	i Nathengtse	55.8	57.4	3069.0	95.8%	0	156	77	32	815	1694	233	62
3	a Taksarjuk	64.4	75.2	3681.0	76.0%	0	0	0	34	0	457	1477	1713
3	b Tholong-Mangdina	52.8	238.2	6760.0	53.7%	2186	1276	182	263	456	1240	799	358
3	c Mangdinatse	57.8	125.3	6425.0	88.7%	0	0	80	0	4255	514	1095	481
3	d Bronmatse	3.1	124.4	249.0	64.6%	124	0	0	0	0	47	29	49
3	e Nathengjuk	22.1	109.1	1827.0	75.8%	273	564	376	0	0	179	310	125
3	f Nyakshithe	12.4	121.5	1228.0	81.5%	198	106	209	196	174	144	105	96
3	g Natheng	6.6	116.3	765.0	99.7%	121	60	200	0	0	60	128	196
3	h Tshorphurong	13.6	15.6	172.0	81.1%	0	26	44	0	0	31	38	33
4	a Kherliok	70.1	560.9	39046.0	99.3%	931	586	0	0	31925	3408	1609	587
4	b Brayteng	59.7	225.5	12158.0	90.3%	6442	668	277	106	2687	1536	284	158
4	c Najab	36.6	301.8	6736.0	61.0%	1853	778	127	145	1533	1622	474	204
4	d Najabjuk	60.2	211.7	12052.0	94.6%	1359	398	48	0	5800	2632	1366	449
4	e Nukteng	7.4	28.1	100.0	48.1%	0	0	0	0	0	100	0	0
4	f Nugmanang	50.0	198.0	8764.0	88.5%	365	0	0	0	3319	3314	1522	244
4	h Tshonang	27.3	54.1	795.0	53.8%	0	0	0	24	0	435	167	169
5	a Moelamthung	22.6	64.4	1071.0	73.6%	0	0	134	95	0	295	259	288
5	b Tshoiteng	71.0	580.0	30896.0	75.0%	2422	2609	135	0	18315	4944	1983	488
5	c Pokshing	26.7	67.6	1261.0	69.9%	68	225	83	209	68	370	161	77
5	d Barma	68.9	373.7	15441.0	60.0%	646	1037	126	87	12132	1246	80	87
5	e Barmatse	58.0	271.0	14316.0	91.1%	0	747	0	0	6286	5021	2262	0

Total per Compartment												
Compartment	Prod. Area (ha)	Volume (m3/ha)	harv. Volume (m3/ha)	Extract. Rate	Timber (Total Volume m3)				Firewood (Total Volume m3)			
					Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1 Zhibreng-Tshengyem	172.8	91.7	13367	84%	1756	1347	574	338	2620	3240	1553	1939
2 Tsemorong-Tsemotse	580.4	165.8	99800	104%	418	4445	1915	1060	50198	31418	5825	4521
3 Taksarjuk-Tshorphurong	232.8	128.6	21107	70%	2902	2032	1091	493	4885	2672	3981	3051
4 Kherliok-Tshonang	311.3	283.2	79651	90%	10950	2430	452	275	45264	13047	5422	1811
5 Moelamthung-Barmatse	247.2	347.5	62985	73%	3136	4618	478	391	36801	11876	4745	940
Total	1544.5	1016.8	276910.0	88%	19162	14872	4510	2557	139768	62253	21526	12262

Production Potential of Forest Management Area: Joenkhar

Comp No.	Sub-Compartment No. Name	Prod. Area (ha)	BA (m2/ha)	BAextr. (m2/ha)	Extract. Rate	Timber (N total)				Firewood (N total)				
						Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm	
1	a Baethangtse	33.9	9.1	9.8	107.3%		282	276	1279	57	630	1381	5116	
1	b Zhibreng	23.0	12.4	10.8	87.1%	91	325	281	1039	104	507	655	260	
1	c Pangzhungjab	39.2	17.4	17.4	100.1%	57	212			261	1257	2872	13296	
1	d Tshengyem	42.0	16.4	8.9	54.2%	418	756	1178	2974	8	17	8	71	
1	e Sonapang	34.7	9.3	7.1	76.0%	86	144	377	524	58	445		4980	
2	a Tsemorong	81.8	17.5	18.7	107.1%		341	476	441	687	4790	5715	17637	
2	b Tsemobarma	70.8	14.1	16.3	115.3%	47	572	641	3560	1321	1641	1922	8900	
2	c Broksarbo	85.2	15.5	18.9	121.9%		129	473		2554	2393	2840	8326	
2	d Nyugde	72.6	15.5	20.2	130.2%		255	934		2097	1878	3580	9511	
2	e Tsemotse	80.8	11.3	9.1	80.8%		1287	715	1192	456	1287	715	8347	
2	f Tsemotsejuk	93.3	11.0	11.2	101.5%	71	1463	912	1267	633	2415	2737	4646	
2	g Bronma	1.7	18.0	13.5	75.1%		72	71					213	
2	h Tshbedi	38.4	15.5	15.4	99.5%	29	917	1707	5138	130	917	996	4347	
2	i Nathengtse	55.8	7.6	8.0	105.4%		160	284	395	330	1776	853	790	
3	a Taksarjuk	64.4	14.9	0.3	2.0%				405		10	81	358	
3	b Tholong-Mangdina	52.8	22.0	17.5	79.7%	461	1321	632	3513	185	1448	2909	5270	
3	c Mangdinatse	57.8	9.8	9.4	95.4%			294		373	591	3826	6813	
3	d Bronmatse	3.1	16.0	8.9	55.8%	40							694	
3	e Nathengjuk	22.1	16.0	13.6	84.7%	97	656	1126			287	1239	1564	
3	f Nyakshithe	12.4	17.5	14.6	83.2%	42	78	630	2100	66	142	378	1400	
3	g Natheng	6.6	17.0	17.1	100.5%	9	68	537			68	402	2608	
3	h Tshorphurong	13.6	2.5	2.1	85.7%		35	138			35	138	384	
4	a Kherliok	70.1	23.3	35.7	153.1%	308	723				3696	3619	5415	8357
4	b Brayteng	59.7	15.5	16.9	109.3%	564	681	973	1351	892	1643	973	2252	
4	c Najab	36.6	23.0	20.9	90.7%	309	689	447	2071	432	1603	1640	2900	
4	d Najabjuk	60.2	22.1	22.4	101.4%	477	331	153			1100	2763	4754	6390
4	e Nukteng	7.4	4.0	2.6	65.0%							153		
4	f Nugmanang	50.0	27.8	26.3	94.7%	143					1228	3764	5168	3480
4	h Tshonang	27.3	9.8	5.3	54.4%					343		531	618	2402
5	a Moelamthung	22.6	11.0	9.0	82.0%				461	1281		361	922	3842
5	b Tshoiteng	71.0	36.7	39.6	108.0%	810	2313	434		2944	5032	6505	6023	
5	c Pokshing	26.7	10.5	8.1	77.5%	28	250	272	3024	28	404	544	1134	
5	d Barma	68.9	13.9	13.2	94.6%	192	984	443	1232	1253	1167	296	1232	
5	e Barmatse	58.0	34.1	31.6	92.6%		756				1908	5024	7539	

Total per Compartment												
Compartment	Prod. Area (ha)	BA (m2/ha)	BAextr. (m2/ha)	Extract. Rate	Timber (N total)				Firewood (N total)			
					Drashing	Cham	Tsim	Poles, posts	> 49cm	30-49cm	20-29 cm	10-19 cm
1 Zhibreng-Tshengyem	172.8	13.2	10.9	82%	652	1719	2112	5816	488	2856	4916	23723
2 Tsemorong-Tsemotse	580.4	13.6	14.8	109%	147	5196	6213	11993	8208	17097	19571	62504
3 Taksarjuk-Tshorphurong	232.8	14.8	9.2	62%	649	2158	3357	6018	624	2581	8973	19091
4 Kherliok-Tshonang	311.3	20.6	22.8	111%	1801	2424	1573	3765	7348	14076	18568	25781
5 Moelamthung-Barmatse	247.2	24.6	24.2	98%	1030	4303	1610	5537	6133	11988	15806	12231
Total	1544.5	86.8	81.9	94%	4279	15800	14865	33129	22801	48598	67834	143330

Silvicultural Measures for Forest Management Area: Joenkhar

Comp No.	Sub-Compartment No. Name	Production Area (ha)	Sivicultural Measures (in ha)			Sivicultural Measures (in % of area)		
			Planting	Thinning	Felling	Planting	Thinning	Felling
1	a Baethangtse	33.9		27.1	6.8		80	20
1	b Zhibreng	23.0		4.6	18.4		20	80
1	c Pangzhungjab	39.2		15.7	23.5		40	60
1	d Tshengyem	42.0	2.5	21.0	18.5	6	50	44
1	e Sonapang	34.7	2.4	16.3	16.3	7	47	47
2	a Tsemorong	81.8	19.6	8.2	54.8	24	10	67
2	b Tsemobarma	70.8		19.8	51.0		28	72
2	c Broksarbo	85.2		57.9	27.3		68	32
2	d Nyugde	72.6	18.9	38.5	15.2	26	53	21
2	e Tsemotse	80.8		70.3	10.5		87	13
2	f Tsemotsejuk	93.3	11.2	37.3	44.8	12	40	48
2	g Bronma	1.7						
2	h Tshebdi	38.4		38.4			100	
2	i Nathengtse	55.8						
3	a Taksarjuk	64.4		32.3			50	
3	b Tholong-Mangdina	52.8		8.2	11.5		16	22
3	c Mangdinatse	57.8		9.8	24.3		17	42
3	d Bronmatse	3.1	3.1			100		
3	e Nathengjuk	22.1		16.6			75	
3	f Nyakshithe	12.4		3.1			25	
3	g Natheng	6.6						
3	h Tshorphurong	13.6						
4	a Kherilok	70.1		32.9	37.2		47	53
4	b Brayteng	59.7		16.1	11.9		27	20
4	c Najab	36.6		3.7	7.3		10	20
4	d Najabjuk	60.2		60.2			100	
4	e Nukteng	7.4	3.7			50		
4	f Nugmanang	50.0		50.0			100	
4	h Tshonang	27.3		3.0			11	
5	a Moelamthung	22.6		7.5			33	
5	b Tshoiteng	71.0		71.0			100	
5	c Pokshing	26.7						
5	d Barma	68.9	7.6			11		
5	e Barmatse	58.0		22.0	36.5		38	63

Compartment	Production Area	Sivicultural Measures (in ha)			Sivicultural Measures (in % of area)		
	(ha)	Planting	Thinning	Felling	Planting	Thinning	Felling
1 Zhibreng-Tshengyem	172.8	4.9	84.7	83.5	49	48	
2 Tsemorong-Tsemotse	580.4	49.7	270.4	203.6	47	35	
3 Taksarjuk-Tshorphurong	232.8	3.1	69.9	35.7	30	15	
4 Kherilok-Tshonang	311.3	3.7	165.9	56.4	53	18	
5 Moelamthung-Barmatse	247.2	7.6	100.5	36.5	41	15	
Total	1544.5	69.0	691.5	415.8	4	45	27

NWFP Occurrence in Forest Management Area of: Joenkar

Comp No.	Sub-Compartment		Prod. Area (ha)	Firewood				Bamboo				Cane				Daphne			
	No.	Name		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse	
				(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	a	Baethangtse	33.9	2.4	7	31.5	93												
1	b	Zhibreng	23	4.6	20	18.4	80	16.1	70	9.2	40							11.5	50
1	c	Pangzhungjab	39.2	3.9	10	35.3	90			7.8	20								
1	d	Tshengyem	42	8.0	19	34.0	81	5.5	13	13.0	31							29.0	69
1	e	Sonapang	34.7	4.5	13	30.2	87			9.4	27							13.9	40
2	a	Tsemorong	81.8			81.8	100												
2	b	Tsemobarma	70.8	15.6	22	55.2	78											4.2	6
2	c	Broksarbo	85.2	57.9	68	27.3	32	30.7	36	38.3	45				15.3	18	46.9	55	
2	d	Nyugde	72.6	23.2	32	49.4	68	72.6	100	18.9	26				8.0	11	38.5	53	
2	e	Tsemotse	80.8			80.8	100			13.7	17								
2	f	Tsemotsejuk	93.3	11.2	12	82.1	88	14.9	16	14.9	16							11.2	12
2	g	Bronma	1.7	1.7	100			1.7	100										
2	h	Tshebdi	38.4	31.5	82	6.9	18	6.9	18										
2	i	Nathengtse	55.8			55.8	100			31.2	56							3.3	6
3	a	Taksarjuk	64.4	60.5	94	3.9	6								21.3	33			
3	b	Tholong-Mangdina	52.8	15.3	29	37.5	71	3.2	6									31.2	59
3	c	Mangdinatse	57.8	26.6	46	24.3	42	2.3	4	4.6	8				26.6	46	24.3	42	
3	d	Bronmatse	3.1			3.1	100			3.1	100							3.1	100
3	e	Nathengjuk	22.1	8.4	38	11.1	50	13.9	63	8.4	38				16.6	75	5.5	25	
3	f	Nyakshithe	12.4			12.4	100	3.1	25									3.1	25
3	g	Natheng	6.6	6.6	100			3.3	50	3.3	50							3.3	50
3	h	Tshorphurong	13.6	1.8	13	1.8	13	10.2	75										
4	a	Kherilok	70.1			70.1	100	18.2	26	51.9	74				3.5	5	66.6	95	
4	b	Brayteng	59.7			51.9	87	4.2	7	28.1	47				4.2	7	11.9	20	
4	c	Najab	36.6			36.6	100	3.7	10	22.0	60				3.7	10	18.3	50	
4	d	Najabjuk	60.2			60.2	100	37.9	63	22.9	38				22.9	38	37.9	63	
4	e	Nukteng	7.4			3.7	50			7.4	100							7.4	100
4	f	Nugmanang	50	11.5	23	38.5	77	19.0	38	31.0	62				11.5	23	38.5	77	
4	h	Tshonang	27.3			27.3	100			27.3	100							18.3	67
5	a	Moelamthung	22.6			18.8	83	7.5	33	7.5	33							11.3	50
5	b	Tshoiteng	71			71.0	100	17.8	25	53.3	75				17.8	25	53.3	75	
5	c	Pokshing	26.7			26.7	100	13.4	50	6.7	25							20.0	75
5	d	Barma	68.9			57.9	84	14.5	21	28.9	42				7.6	11	43.4	63	
5	e	Barmatse	58	11.0	19	47.0	81	11.0	19	47.0	81				18.0	31	40.0	69	

Compartment	Prod. Area (ha)	Firewood				Bamboo				Cane				Daphne					
		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse		Abundant		Sparse			
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)		
1 Zhibreng-Tshengyem	172.8	23.4	14	149.4	86	21.6	12	39.4	23									54.4	31
2 Tsemorong-Tsemotse	580.4	141.1	24	439.3	76	126.8	22	117.1	20						23.3	4	104.1	18	
3 Taksarjuk-Tshorphurong	232.8	119.2	51	93.9	40	36.0	15	19.4	8						64.4	28	70.5	30	
4 Kherilok-Tshonang	311.3	11.5	4	288.3	93	83.0	27	190.5	61						45.7	15	199.0	64	
5 Moelamthung-Barmatse	247.2	11.0	4	221.3	90	64.0	26	143.3	58						43.3	18	168.0	68	
Total	1544.5	306.2	20	1192.3	77	331.4	21	509.7	33						176.8	11	595.9	39	

Current Side Uses within Forest Management Area: Joenkhar

Comp No.	Sub-Compartment		Prod. Area (ha)	Grazing				Sokshing				Lopping			
	No.	Name		Intensive		Extensive		Intensive		Extensive		Intensive		Extensive	
			(ha)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	a	Baethangtse	33.9	2.3	7	31.5	93								
1	b	Zhibreng	23.0	2.3	10	20.7	90								
1	c	Pangzhungjab	39.2	3.9	10	35.3	90							3.9	10
1	d	Tshengyem	42.0	5.5	13	37.0	88							16.0	38
1	e	Sonapang	34.7	4.5	13	30.2	87								
2	a	Tsemorong	81.8	7.8	10	73.6	90								
2	b	Tsemobarma	70.8	7.8	11	63.0	89								
2	c	Broksarbo	85.2	11.9	14	73.3	86								
2	d	Nyugde	72.6	34.1	47	38.5	53								
2	e	Tsemotse	80.8			80.8	100								
2	f	Tsemotsejuk	93.3			93.3	100								
2	g	Bronma	1.7			1.7	100								
2	h	Tshebdi	38.4	17.3	45	21.1	55				10.4	27			
2	i	Nathengtse	55.8	7.3	13	49.1	88								
3	a	Taksarjuk	64.4	25.1	39	39.3	61								
3	b	Tholong-Mangdina	52.8	31.2	59	21.6	41				6.3	12	18.5	35	
3	c	Mangdinatse	57.8	16.8	29	38.7	67				28.9	50	12.1	21	
3	d	Bronmatse	3.1			3.1	100						3.1	100	
3	e	Nathengjuk	22.1	11.1	50	11.1	50				2.9	13			
3	f	Nyakshithe	12.4			9.3	75						6.2	50	
3	g	Natheng	6.6			3.3	50								
3	h	Tshorphurong	13.6												
4	a	Kherilok	70.1			70.1	100							37.2	53
4	b	Brayteng	59.7	51.9	87	4.0	7				35.8	60	11.9	20	
4	c	Najab	36.6	25.6	70	7.3	20				25.6	70	7.3	20	
4	d	Najabjuk	60.2	26.5	44	33.7	56				7.8	13	53.0	88	
4	e	Nukteng	7.4												
4	f	Nugmanang	50.0			50.0	100						50.0	100	
4	h	Tshonang	27.3	12.0	44	15.3	56						18.3	67	
5	a	Moelamthung	22.6			7.5	33								
5	b	Tshoiteng	71.0	28.4	40	42.6	60				17.8	25	53.3	75	
5	c	Pokshing	26.7	6.7	25	16.8	63						23.5	88	
5	d	Barma	68.9	22.0	32	46.9	68				3.7	5	61.3	89	
5	e	Barmatse	58.0	25.5	44	32.5	56				18.0	31	40.0	69	

Compartment	Prod. Area (ha)	Grazing				Sokshing				Lopping			
		Intensive		Extensive		Intensive		Extensive		Intensive		Extensive	
	(ha)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
1	Zhibreng-Tshengyem	172.8	18.5	11	154.7	90						19.9	12
2	Tsemorong-Tsemotse	580.4	86.1	15	494.4	85				10.4	2		
3	Taksarjuk-Tshorphurong	232.8	84.1	36	126.4	54				38.1	16	39.9	17
4	Kherilok-Tshonang	311.3	116.1	37	180.4	58				69.3	22	177.7	57
5	Moelamthung-Barmatse	247.2	82.6	33	146.2	59				39.4	16	178.1	72
Total		1544.5	387.4	25	1102.1	71				157.1	10	415.6	27

Calculation of AAC:

1. The average rotation period is calculated by multiplication of the proportion forest type * rotation period of forest type
2. The sustainable AAC is determined by dividing the total standing stock by the average rotation period
3. The silvicultural AAC is determined by dividing the production period by the planning period of 10 years
4. The AAC is fixed at the sustainable AAC or silvicultural AAC, whichever is lower!

Unit	Forest Type Distribution								
	Hemlock	Fir	Spruce	Mix. Con.	Bluepine	Chirpine	Hardwood	Mixed HC	Total
Proportion	0%	8%	0%	4%	0%	0%	74%	13%	100%
Rotation period	130	140	130	120	90	90	130	120	129

AACsust. = standing volume/rotation period	2449 m ³
	1.6 m ³ /ha
AACsilv. = prod. Potential/10 years	27691 m ³
	18 m ³ /ha
AACfixed	2449 m ³
	1.6 m ³ /ha

Prod. Potential/AAC =	113 years
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Annexure 17: Compartment Register for Joenkhar FMA

Sub-Compartment Record																
Geog	Sakteng	Comp.	1Zhibreng-Tshengyem	Sub-Comp.	Baethangtse	No.	a									
Areas in ha																
Non Forest Area	1.2	Protection	5.2	In-operable	22.6	Production	33.9									
Forest Composition and Description																
Overall age class of this sub-compartment was matured and composed of all hardwood tree species having closed canopy.						Stand data										
						Bas. Area (m2/ha)	9.1									
						Tot. Vol. (m3/ha)	52.4									
						Vconifer %	16%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Firewood	7	93				
						Fir		Natural	100	Bamboo						
						Spruce		Coppice		Cane						
						Mixed Conifer		Canopy	%	Daphne						
						Blue Pine		Dense								
						Chir Pine		Closed	87							
						Hardwood	100	Open	13							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	13	Grazing	6.7	93				
						Immature	40	Average	87	Shokshing						
						Mature	60	Poor		Lopping						
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%	%				
Gentle	7	Stable	33	High	13											
Moderate	40	Moderate	67	Moderate	73											
Steep	53	Unstable		Low	13											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.																
Exbucklandia																
Litsea spp.																
Michelia spp.																
Persea spp.																
Quercus spp.	307	283		41	4	1						46	17			
Schima spp.																
Walnut																
Other Broadleave	401	283	174		11	3	2					189	69			
Conifer spp.	47	71	23		8	8						39	14			
Total	755	637	196	49	24	3	2					274	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		The improvement measures like thinning and felling can be carried out to extract firewood and poles.													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
Sokshing																
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50																
Drashing			100													
Firewood	57	2		112												
30-49																
Cham	282	8	100	178												
Firewood	630	19		503												
20-29																
Tsim	276	8	100	71												
Firewood	1381	41		457												
10-19																
Poles, etc.	1279	38	96	79												
Firewood	5116	151		359												
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	27.1	80%														
Felling	6.8	20%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																
Geog	Sakteng	Comp.	1Zhibreng-Tshengyem	Sub-Comp.	Zhibreng	No.	b									
Areas in ha																
Non Forest Area	1.7	Protection	5.7	In-operable	34.4	Production	23.0									
Forest Composition and Description																
Dominated by matured stand of hardwood species having closed canopy. Some part of the sub-compartment has a dense growth of bamboo species.						Stand data										
						Bas. Area (m2/ha)	12.4									
						Tot. Vol. (m3/ha)	91.9									
						Vconifer %	28%									
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood	20	80				
						Spruce		Coppice		Bamboo	70	40				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	10	Daphne		50				
						Chir Pine		Closed	60							
						Hardwood	90	Open	30							
						Mixed H/C	10	Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good		Grazing	10	90				
						Immature	20	Average	100	Shokshing						
						Mature	70	Poor		Lopping						
						Overmature	10	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle	10	Stable		High	10					
						Moderate	60	Moderate	90	Moderate	90					
						Steep	30	Unstable	10	Low						
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.																
Exbucklandia																
Litsea spp.																
Michelia spp.				4	2							6	4			
Persea spp.					4			0				5	3			
Quercus spp.	106	35		4	2	3	1	1				11	7			
Schima spp.																
Walnut																
Other Broadleave	141	283	11	29	15	8	5		0	1		68	43			
Conifer spp.	248	212	45	8	8	4	2	2	0			69	44			
Total	495	531	57	45	31	14	8	3	1	1		159	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Felling and thinning for firewood, poles and timber.														
	Improvement	√														
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	91	4	65	263											
	Firewood	104	5		292											
30-49	Cham	325	14	81	275											
	Firewood	507	22		432											
20-29	Tsim	281	12	91	80											
	Firewood	655	29		177											
10-19	Poles, etc.	1039	45	100	59											
	Firewood	260	11		18											
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	4.6	20%														
Felling	18.4	80%														
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																																																																																																																																							
Geog	Sakteng	Comp.	1Zhibreng-Tshengyem	Sub-Comp.	Pangzhungjab	No.	c																																																																																																																																
Areas in ha																																																																																																																																							
Non Forest Area	11.4	Protection	16.2	In-operable	58.7	Production	39.2																																																																																																																																
Forest Composition and Description																																																																																																																																							
Hardwood forest with closed canopy cover and age class includes immature to matured stands.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)		17.4																																																																																																																															
						Tot. Vol. (m3/ha)		114.4																																																																																																																															
Vconifer %		10%																																																																																																																																					
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Species		Height	N/ha per diameter class								Total (> 10cm)																																																																																																																												
		0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																									
Beilschmiedia spp.																																																																																																																																							
Cinnamomum spp.																																																																																																																																							
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Litsea spp.																																																																																																																																							
Michelia spp.																																																																																																																																							
Persea spp.																																																																																																																																							
Quercus spp.				113	20	10	6	2	2	0	0		155	34																																																																																																																									
Schima spp.																																																																																																																																							
Walnut																																																																																																																																							
Other Broadleave		566	424	226	53	10	5		2	0	1		298	65																																																																																																																									
Conifer spp.						4	1	3					9	2																																																																																																																									
Total		566	424	340	73	25	13	5	4	1	1		461	100																																																																																																																									
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities		The trees can be allotted for firewood with the silviculture measures like thinning.																																																																																																																																				
	Improvement																																																																																																																																						
	Timber Use																																																																																																																																						
	Firewood Use	√																																																																																																																																					
	Silvopasture																																																																																																																																						
	Sokshing																																																																																																																																						
Production Potential (N, Volume)					No of trees removed each year										Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
> 80	Drashing	57	1	76	144																																																																																																																																		
	Firewood	261	7		960																																																																																																																																		
30-49	Cham	212	5	100	162																																																																																																																																		
	Firewood	1257	32		1190																																																																																																																																		
20-29	Tsim			100																																																																																																																																			
	Firewood	2872	73		826																																																																																																																																		
10-19	Poles, etc.			100																																																																																																																																			
	Firewood	13296	340		981																																																																																																																																		
Silvicultural Measures				Area in ha implemented per year										Total	%																																																																																																																								
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
Planting																																																																																																																																							
Thinning	15.7	40%																																																																																																																																					
Felling	23.5	60%																																																																																																																																					
Assessment carried out by		SWS										Year:	2019																																																																																																																										

Sub-Compartment Record																			
Geog	Joenkar	Comp.	1Zhibreng-Tshengyem	Sub-Comp.	Tshengyem	No.	d												
Areas in ha																			
Non Forest Area	21.0	Protection	1.9	In-operable	23.7	Production	42.0												
Forest Composition and Description																			
Forest type is dominated by mixed H/C followed by hardwood. The stands were mature with mostly closed canopy and the the condition of the forest was average.						Stand data													
						Bas. Area (m2/ha)	16.4												
						Tot. Vol. (m3/ha)	122.7												
						Vconifer %	36%												
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S							
						Hemlock		Plantation		Type	%	%							
						Fir		Natural	100	Firewood	19	81							
						Spruce		Coppice		Bamboo	13	31							
						Mixed Conifer		Canopy	%	Cane									
						Blue Pine		Dense		Daphne		69							
						Chir Pine		Closed	88										
						Hardwood	25	Open	13										
						Mixed H/C	75	Unstocked		Forest Use	I	E							
						Age Class	%	Condition	%	Type	%	%							
						Young		Good	6	Grazing	13	88							
						Immature	19	Average	94	Shokshing									
						Mature	69	Poor		Lopping		38							
						Overmature	13	Site Characteristics											
						Slope	%	Erosiveness	%	Soil Cover	% %								
						Gentle	6	Stable	25	High	13								
						Moderate	50	Moderate	63	Moderate	81								
						Steep	44	Unstable	13	Low	6								
						Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)	
								<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%
Beilschmiedia spp.																			
Cinnamomum spp.																			
Exbucklandia																			
Litsea spp.																			
Michelia spp.			7	3	3							12	5						
Persea spp.			7	5	4	2		0				18	7						
Quercus spp.	155	133	7	10	10	3	2	3		1		36	14						
Schima spp.																			
Walnut				3								3	1						
Other Broadleave	309	464	64	10	6	3	3	2	1			89	34						
Conifer spp.	66	44	64	18	10	6	4	3	1			106	40						
Total	531	641	149	48	34	14	9	7	2	1		264	100						
Future Management & Monitoring of Activities																			
Manag. Option	No activities		The matured trees can be felled for the purpose of timber and fallen trees can be used to meet the demand of firewood. In few pockets of area the intervention like plantation are also needed.																
	Improvement																		
	Timber Use	√																	
	Firewood Use	√																	
	Silvopasture																		
	Sokshing																		
Production Potential (N, Volume)				No of trees removed each year												Total	%		
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028					
>50	Drashing	418	10	93	1129														
	Firewood	323	8		1052														
30-49	Cham	756	18	73	641														
	Firewood	712	17		627														
20-29	Tsim	1178	28	74	326														
	Firewood	321	8		93														
10-19	Poles, etc.	2974	71	95	170														
	Firewood	2974	71		212														
Silvicultural Measures				Area in ha implemented per year												Total	%		
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028						
Planting	2.6	6%																	
Thinning	21.0	50%																	
Felling	18.4	44%																	
Assessment carried out by		SWS												Year:	2019				

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	1Zhibreng-Tshengyem	Sub-Comp.	Sonapang	No.	e																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	24.1	Protection	3.7	In-operable	23.2	Production	34.7																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Stands were mostly matured composing of hardwood speices.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	9.3																																																																																																																																	
						Tot. Vol. (m3/ha)	66.6																																																																																																																																	
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Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
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Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																												
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Michelia spp.																																																																																																																																								
Persea spp.																																																																																																																																								
Quercus spp.	519	330	60	5	14	8	2	1	1	0		91	41																																																																																																																											
Schima spp.																																																																																																																																								
Walnut																																																																																																																																								
Other Broadleave	519	519	91	3		3		1	0			97	44																																																																																																																											
Conifer spp.	141	165	15	11	4		2	1				33	15																																																																																																																											
Total	1179	1014	166	19	18	10	3	2	1	0		220	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities		Need plantation near the stream, however controlled thinning can also be done to meet the demand of firewood.																																																																																																																																					
	Improvement	√																																																																																																																																						
	Timber Use																																																																																																																																							
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Production Potential (N, Volume)				No of trees removed each year																																																																																																																																				
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																								
>50	Drashing	86	2	60	220																																																																																																																																			
	Firewood	58	2		204																																																																																																																																			
30-49	Cham	144	4	60	91																																																																																																																																			
	Firewood	445	13		488																																																																																																																																			
20-29	Tsim	377	11	57	97																																																																																																																																			
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10-19	Poles, etc.	524	15	95	30																																																																																																																																			
	Firewood	4980	143		369																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year																																																																																																																																				
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																									
Planting	2.3	7%																																																																																																																																						
Thinning	16.2	47%																																																																																																																																						
Felling	16.2	47%																																																																																																																																						
Assessment carried out by		SWS												Year:	2019																																																																																																																									

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Tsemorong	No.	a																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	6.8	Protection	2.2	In-operable	15.6	Production	81.8																																																																																																																																	
Forest Composition and Description																																																																																																																																								
This subcompartment falls in hardwood forest with matured age class. Canopy cover was mostly closed and has a good regeneration of broadleaved species.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	17.5																																																																																																																																	
						Tot. Vol. (m3/ha)	123.6																																																																																																																																	
						Vconifer %																																																																																																																																		
<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>100</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td></td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td></td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>5</td> <td>Daphne</td> <td></td> <td>14</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>71</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>24</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <td>Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>5</td> <td>Grazing</td> <td>9.5</td> <td>90</td> </tr> <tr> <td>Immature</td> <td>5</td> <td>Average</td> <td>95</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>95</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="4">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <td>Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td colspan="2">%</td> </tr> <tr> <td>Gentle</td> <td></td> <td>Stable</td> <td>57</td> <td>High</td> <td colspan="2">5</td> </tr> <tr> <td>Moderate</td> <td>48</td> <td>Moderate</td> <td>43</td> <td>Moderate</td> <td colspan="2">71</td> </tr> <tr> <td>Steep</td> <td>52</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2">24</td> </tr> </tbody> </table>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood		100	Spruce		Coppice		Bamboo			Mixed Conifer		Canopy		Cane			Blue Pine		Dense	5	Daphne		14	Chir Pine		Closed	71				Hardwood	100	Open	24				Mixed H/C		Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	5	Grazing	9.5	90	Immature	5	Average	95	Shokshing			Mature	95	Poor		Lopping			Overmature		Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle		Stable	57	High	5		Moderate	48	Moderate	43	Moderate	71		Steep	52	Unstable		Low	24					
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
Hemlock		Plantation		Type	%	%																																																																																																																																		
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Immature	5	Average	95	Shokshing																																																																																																																																				
Mature	95	Poor		Lopping																																																																																																																																				
Overmature		Site Characteristics																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle		Stable	57	High	5																																																																																																																																			
Moderate	48	Moderate	43	Moderate	71																																																																																																																																			
Steep	52	Unstable		Low	24																																																																																																																																			
Species		Height 0.3<1.3 m	N/ha per diameter class								Total (> 10cm)																																																																																																																													
			<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Beilschmiedia spp.																																																																																																																																								
Cinnamomum spp.				5	2	3	1						11	3																																																																																																																										
Exbucklandia																																																																																																																																								
Litsea spp.																																																																																																																																								
Michelia spp.																																																																																																																																								
Persea spp.																																																																																																																																								
Quercus spp.				124	41	25	15	4	1	0			210	57																																																																																																																										
Schima spp.					4								4	1																																																																																																																										
Walnut																																																																																																																																								
Other Broadleave		404	1533	92	29	17	5	4					146	39																																																																																																																										
Conifer spp.																																																																																																																																								
Total		404	1533	221	76	45	21	7	1	0			371	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities	Plantation is recommended.																																																																																																																																						
	Improvement	√																																																																																																																																						
	Timber Use																																																																																																																																							
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	Silvopasture																																																																																																																																							
	Sokshing																																																																																																																																							
Production Potential (N, Volume)				No of trees removed each year											Total	%																																																																																																																								
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing																																																																																																																																							
	Firewood	687	8	95	1720																																																																																																																																			
30-49	Cham	341	4	96	280																																																																																																																																			
	Firewood	4790	59	100	4491																																																																																																																																			
20-29	Tsim	476	6	100	129																																																																																																																																			
	Firewood	5715	70	100	1754																																																																																																																																			
10-19	Poles, etc.	441	5	100	31																																																																																																																																			
	Firewood	17637	216	100	1351																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year											Total	%																																																																																																																								
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting	19.5	24%																																																																																																																																						
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Assessment carried out by		SWS											Year:	2019																																																																																																																										

Sub-Compartment Record																																																																																																																																					
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Tsemobarma	No.	b																																																																																																																														
Areas in ha																																																																																																																																					
Non Forest Area	10.5	Protection	1.3	In-operable	27.5	Production	70.8																																																																																																																														
Forest Composition and Description																																																																																																																																					
The forest type is hardwood with mostly matured stand. The extensive grazing was common in the sub-compartment.							Stand data																																																																																																																														
							Bas. Area (m2/ha)	14.1																																																																																																																													
							Tot. Vol. (m3/ha)	259.2																																																																																																																													
							Vconifer %																																																																																																																														
<p>Number of trees/ha by diameter class (dbh>10 cm)</p> <p>Legend: Conifer spp., Schima spp., Michelia spp., Cinnamomum spp., Other Broadleave, Quercus spp., Litsea spp., Beilschmiedia spp., Walnut, Persea spp., Exbucklandia</p>							<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew. Type</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Firewood</td> <td>22</td> <td>78</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Bamboo</td> <td></td> <td></td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <th>Canopy</th> <th>%</th> <td></td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>11</td> <td>Daphne</td> <td></td> <td>6</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>83</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>94</td> <td>Open</td> <td>6</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td>6</td> <td>Unstocked</td> <td></td> <th>Forest Use</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>11</td> <td>Grazing</td> <td>11</td> <td>89</td> </tr> <tr> <td>Immature</td> <td>6</td> <td>Average</td> <td>89</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>67</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td>28</td> <th colspan="2">Site Characteristics</th> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>28</td> <td>Stable</td> <td>39</td> <td>High</td> <td colspan="2">11</td> </tr> <tr> <td>Moderate</td> <td>39</td> <td>Moderate</td> <td>61</td> <td>Moderate</td> <td colspan="2">83</td> </tr> <tr> <td>Steep</td> <td>33</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2">6</td> </tr> </tbody> </table>	Forest Type	%	Stand Type	%	NWFP+firew. Type	A	S	Hemlock		Plantation		Firewood	22	78	Fir		Natural	100	Bamboo			Spruce		Coppice		Cane			Mixed Conifer		Canopy	%				Blue Pine		Dense	11	Daphne		6	Chir Pine		Closed	83				Hardwood	94	Open	6				Mixed H/C	6	Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	11	Grazing	11	89	Immature	6	Average	89	Shokshing			Mature	67	Poor		Lopping			Overmature	28	Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	28	Stable	39	High	11		Moderate	39	Moderate	61	Moderate	83		Steep	33	Unstable		Low	6	
Forest Type	%	Stand Type	%	NWFP+firew. Type	A	S																																																																																																																															
Hemlock		Plantation		Firewood	22	78																																																																																																																															
Fir		Natural	100	Bamboo																																																																																																																																	
Spruce		Coppice		Cane																																																																																																																																	
Mixed Conifer		Canopy	%																																																																																																																																		
Blue Pine		Dense	11	Daphne		6																																																																																																																															
Chir Pine		Closed	83																																																																																																																																		
Hardwood	94	Open	6																																																																																																																																		
Mixed H/C	6	Unstocked		Forest Use	I	E																																																																																																																															
Age Class	%	Condition	%	Type	%	%																																																																																																																															
Young		Good	11	Grazing	11	89																																																																																																																															
Immature	6	Average	89	Shokshing																																																																																																																																	
Mature	67	Poor		Lopping																																																																																																																																	
Overmature	28	Site Characteristics																																																																																																																																			
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																
Gentle	28	Stable	39	High	11																																																																																																																																
Moderate	39	Moderate	61	Moderate	83																																																																																																																																
Steep	33	Unstable		Low	6																																																																																																																																
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																									
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																								
Beilschmiedia spp.																																																																																																																																					
Cinnamomum spp.			19		3							22	8																																																																																																																								
Exbucklandia																																																																																																																																					
Litsea spp.																																																																																																																																					
Michelia spp.					1							1	0																																																																																																																								
Persea spp.			6		1	1		0				8	3																																																																																																																								
Quercus spp.	98	118	6	11	5	2	2	1	1	1	9	38	13																																																																																																																								
Schima spp.																																																																																																																																					
Walnut																																																																																																																																					
Other Broadleave	648	1081	157	27	18	9	2	2	0	1	4	221	76																																																																																																																								
Conifer spp.																																																																																																																																					
Total	747	1199	189	38	29	12	4	3	2	2	13	291	100																																																																																																																								
Future Management & Monitoring of Activities																																																																																																																																					
Manag. Option	No activities	Felling for firewood is suggested.																																																																																																																																			
	Improvement																																																																																																																																				
	Timber Use																																																																																																																																				
	Firewood Use	√																																																																																																																																			
	Silvopasture																																																																																																																																				
	Sokshing																																																																																																																																				
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																				
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																							
> 50	Drashing	47	1	82	143																																																																																																																																
	Firewood	1321	19		10813																																																																																																																																
30-49	Cham	572	8	77	389																																																																																																																																
	Firewood	1641	23		1565																																																																																																																																
20-29	Tsim	641	9	94	174																																																																																																																																
	Firewood	1922	27		559																																																																																																																																
10-19	Poles, etc.	3560	50	93	250																																																																																																																																
	Firewood	8900	126		630																																																																																																																																
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																				
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																								
Planting																																																																																																																																					
Thinning	19.7	28%																																																																																																																																			
Felling	51.1	72%																																																																																																																																			
Assessment carried out by		SWS										Year:	2019																																																																																																																								

Sub-Compartment Record																
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Broksarbo	No.	c									
Areas in ha																
Non Forest Area	2.8	Protection	1.9	In-operable	11.6	Production	85.2									
Forest Composition and Description																
Hardwood forest type with closed canopy cover. Age class was mostly matured and was having dense bamboo undergrowth. Grazing was extensive with sparsely distributed firewood and daphne.						Stand data										
						Bas. Area (m2/ha)	15.5									
						Tot. Vol. (m3/ha)	308.0									
						Vconifer %										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	27	Grazing	14	86				
						Immature	9	Average	73	Shokshing						
						Mature	77	Poor		Lopping						
						Overmature	14	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle	27	Stable	32	High	9					
						Moderate	59	Moderate	68	Moderate	91					
						Steep	14	Unstable		Low						
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.				2								2	1			
Exbucklandia																
Litsea spp.																
Michelia spp.																
Persea spp.	32			7	1	2	0					10	5			
Quercus spp.	32	48	10	6	4	4	3	2	2	1	12	43	19			
Schima spp.																
Walnut				2	1	2						5	2			
Other Broadleave	450	579	98	33	12	11	6	0	2	1	3	167	74			
Conifer spp.																
Total	514	627	108	50	18	18	9	2	4	2	15	227	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Need thinning and felling of matured stand for firewood.														
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing															
	Firewood	2554	30	92	20462											
30-49	Cham	129	2	82	116											
	Firewood	2393	28		2417											
20-29	Tsim	473	6	78	141											
	Firewood	2840	33		788											
10-19	Poles, etc.															
	Firewood	8326	98	90	594											
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	58.1	68%														
Felling	27.1	32%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Nyugde	No.	d									
Areas in ha																
Non Forest Area	11.2	Protection	3.6	In-operable	22.9	Production	72.6									
Forest Composition and Description																
Hardwood forest composed of all age class with mostly closed canopy and has abundant bamboo growth.						Stand data										
						Bas. Area (m2/ha)	15.5									
						Tot. Vol. (m3/ha)	242.0									
						Vconifer %	16%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood	32	68				
						Spruce		Coppice		Bamboo	100	26				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense		Daphne	11	53				
						Chir Pine		Closed	68							
						Hardwood	100	Open	26							
						Mixed H/C		Unstocked	5	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	11	Good	21	Grazing	47	53				
						Immature	26	Average	58	Shokshing						
						Mature	58	Poor	21	Lopping						
						Overmature	5	Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	26	Stable	42	High	26											
Moderate	47	Moderate	47	Moderate	58											
Steep	26	Unstable	11	Low	16											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.																
Exbucklandia																
Litsea spp.																
Michelia spp.																
Persea spp.				2	1							3	1			
Quercus spp.																
Schima spp.																
Walnut																
Other Broadleave	503	819	131	64	19	9	9	7	2	1	9	251	97			
Conifer spp.					1	1					3	6	2			
Total	503	819	131	66	21	10	9	7	2	1	12	259	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Fallen timber recommended for firewood. Plantation is needed as well.													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50																
Drashing			93													
Firewood	2097	29		13300												
30-49																
Cham	255	4	96	233												
Firewood	1878	26		1534												
20-29																
Tsim	934	13	94	259												
Firewood	3580	49		970												
10-19																
Poles, etc.			100													
Firewood	9511	131		668												
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	19.1	26%														
Thinning	38.2	53%														
Felling	15.3	21%														
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Tsemotse	No.	e																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	0.9	Protection	7.1	In-operable	7.0	Production	80.8																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Overall age class is matured which falls mostly in fir forest with closed canopy.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	11.3																																																																																																																																	
						Tot. Vol. (m3/ha)	74.0																																																																																																																																	
						Vconifer %	49%																																																																																																																																	
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td>74</td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>100</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td></td> <td>17</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td></td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>74</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>26</td> <td>Open</td> <td>17</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>9</td> <td>Forest Use</td> <td>i</td> <td>E</td> </tr> <tr> <td>Age Class</td> <td>%</td> <td>Condition</td> <td>%</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>22</td> <td>Grazing</td> <td></td> <td>100</td> </tr> <tr> <td>Immature</td> <td>17</td> <td>Average</td> <td>70</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>78</td> <td>Poor</td> <td>9</td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td>4</td> <td colspan="4">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <td>Slope</td> <td>%</td> <td>Erosiveness</td> <td>%</td> <td>Soil Cover</td> <td colspan="2">% %</td> </tr> <tr> <td>Gentle</td> <td>4</td> <td>Stable</td> <td>48</td> <td>High</td> <td colspan="2">9</td> </tr> <tr> <td>Moderate</td> <td>22</td> <td>Moderate</td> <td>48</td> <td>Moderate</td> <td colspan="2">74</td> </tr> <tr> <td>Steep</td> <td>74</td> <td>Unstable</td> <td>4</td> <td>Low</td> <td colspan="2">17</td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir	74	Natural	100	Firewood		100	Spruce		Coppice		Bamboo		17	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne			Chir Pine		Closed	74				Hardwood	26	Open	17				Mixed H/C		Unstocked	9	Forest Use	i	E	Age Class	%	Condition	%	Type	%	%	Young		Good	22	Grazing		100	Immature	17	Average	70	Shokshing			Mature	78	Poor	9	Lopping			Overmature	4	Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	% %		Gentle	4	Stable	48	High	9		Moderate	22	Moderate	48	Moderate	74		Steep	74	Unstable	4	Low	17	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
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Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																												
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Schima spp.																																																																																																																																								
Walnut																																																																																																																																								
Other Broadleaved	1307	1199	103	16	14	9	2	1				145	69																																																																																																																											
Conifer spp.	323	138	20	16	14	12	3	0				65	31																																																																																																																											
Total	1630	1338	123	32	28	21	5	1				210	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities	Thinning recommended for firewood and poles.																																																																																																																																						
	Improvement	√																																																																																																																																						
	Timber Use	√																																																																																																																																						
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Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing		90																																																																																																																																					
	Firewood	456	6		997																																																																																																																																			
30-49	Cham	1287	16	99	972																																																																																																																																			
	Firewood	2610	32		2467																																																																																																																																			
20-29	Tsim	715	9	89	185																																																																																																																																			
	Firewood	1574	19		420																																																																																																																																			
10-19	Poles, etc.	1192	15	96	68																																																																																																																																			
	Firewood	8347	103		586																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																							
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting																																																																																																																																								
Thinning	70.2	87%																																																																																																																																						
Felling	10.5	13%																																																																																																																																						
Assessment carried out by				SWS										Year:	2019																																																																																																																									

Sub-Compartment Record																	
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Tsemotsejuk	No.	f										
Areas in ha																	
Non Forest Area	1.5	Protection	9.5	In-operable		Production	93.3										
Forest Composition and Description																	
The subcompartment includes fir, mixed conifer and hardwood forest types with matured age class. Canopy closure was closed with sparsely distributed firewood and bamboo.						Stand data											
						Bas. Area (m2/ha)	11.0										
						Tot. Vol. (m3/ha)	109.3										
						Vconifer %	50%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	48	Natural	100	Firewood	12	88					
						Spruce		Coppice		Bamboo	16	16					
						Mixed Conifer	16	Canopy	%	Cane							
						Blue Pine		Dense		Daphne		12					
						Chir Pine		Closed	64								
						Hardwood	36	Open	36								
						Mixed H/C		Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good	16	Grazing		100					
						Immature	12	Average	76	Shokshing							
						Mature	76	Poor	8	Lopping							
						Overmature	12	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%	%					
						Gentle		Stable	16	High		4					
						Moderate	36	Moderate	84	Moderate		84					
						Steep	64	Unstable		Low		12					
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Beilschmiedia spp.																	
Cinnamomum spp.					2	1						2	1				
Exbucklandia																	
Litsea spp.																	
Michelia spp.																	
Persea spp.					1	1						1	1				
Quercus spp.					2	4		0				6	4				
Schima spp.																	
Walnut																	
Other Broadleaves	410	453	50	36	15	9	2	1	0			113	72				
Conifer spp.	99	127	14	7	2	6	2	0	2		3	35	22				
Total	509	580	63	42	22	19	4	2	2	2	3	158	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Need thinning and felling for firewood. Plantation recommended in some pockets of subcompartment.															
	Improvement	√															
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	71	1	72	206												
	Firewood	633	7		1766												
30-49	Cham	1463	16	100	1311												
	Firewood	2415	26		2358												
20-29	Tsim	912	10	92	240												
	Firewood	2737	29		742												
10-19	Poles, etc.	1267	14	100	72												
	Firewood	4646	50		326												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting	11.2	12%															
Thinning	37.3	40%															
Felling	44.8	48%															
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Bronma	No.	g									
Areas in ha																
Non Forest Area	10.9	Protection	6.6	In-operable	41.8	Production	1.7									
Forest Composition and Description																
Mixed conifer forest with matured stand. Most of the plot falls on the steep and were inoperable.						Stand data										
						Bas. Area (m2/ha)	18.0									
						Volume (m3/ha)	118.7									
						Volume conifer %	100%									
<p style="text-align: center;">Number of trees/ha by diameter class (dbh>10cm)</p> <p>Legend:</p> <ul style="list-style-type: none"> Other Broadleaves Acer Fir Bluepine Rhododendron Oak Spruce Chirpine Betula Other Conifers Hemlock 						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood	100					
						Spruce		Coppice		Bamboo	100					
						Mixed Conifer	100	Canopy	%	Cane						
						Blue Pine		Dense		Daphne						
						Chir Pine		Closed								
						Hardwood		Open	100							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good		Grazing		100				
						Immature		Average	100	Shokshing						
						Mature	100	Poor		Lopping						
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle		Stable		High												
Moderate	100	Moderate	100	Moderate	100											
Steep		Unstable		Low												
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine																
Hemlock					62							62	23			
Spruce																
Fir																
Other Conifers				163	42							205	77			
Oak																
Acer																
Betula																
Rhododendron																
Other Broadleaves																
Total				163	104							267	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	√														
	Improvement															
	Timber Use															
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)					No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing		###													
	Firewood															
30-49	Cham	72	42	40	47											
	Firewood															
20-29	Tsim	71	41	100	20											
	Firewood	213	122		59											
10-19	Poles, etc.			###												
	Firewood															
Silvicultural Measures					Area in ha implemented per year										Total	%
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting																
Thinning																
Felling																
Assessment carried out by					SWS										Year:	2019

Sub-Compartment Record																																																																																																																																									
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Areas in ha																																																																																																																																									
Non Forest Area	3.1	Protection	6.0	In-operable	48.9	Production	38.4																																																																																																																																		
Forest Composition and Description																																																																																																																																									
Dominated by mixedconifer forest with different age classes.						<table border="1"> <thead> <tr> <th colspan="2">Stand data</th> </tr> </thead> <tbody> <tr> <td>Bas. Area (m2/ha)</td> <td>15.5</td> </tr> <tr> <td>Volume (m3/ha)</td> <td>114.1</td> </tr> <tr> <td>Volume conifer %</td> <td>93%</td> </tr> </tbody> </table>					Stand data		Bas. Area (m2/ha)	15.5	Volume (m3/ha)	114.1	Volume conifer %	93%																																																																																																																							
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Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																			
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Steep	18	Unstable	9	Low	9																																																																																																																																				
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																													
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																												
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Hemlock																																																																																																																																									
Spruce																																																																																																																																									
Fir	322	322	134	56	19	11	2	1				223	58																																																																																																																												
Other Conifers	450	257	21	11	23	3	1					59	15																																																																																																																												
Oak																																																																																																																																									
Acer																																																																																																																																									
Betula																																																																																																																																									
Rhododendron	129	129	93	7								100	26																																																																																																																												
Other Broadleaves																																																																																																																																									
Total	900	707	247	74	42	15	3	1				382	100																																																																																																																												
Future Management & Monitoring of Activities																																																																																																																																									
Manag. Option	No activities	Thinning for firewood and poles.																																																																																																																																							
	Improvement																																																																																																																																								
	Timber Use	√																																																																																																																																							
	Firewood Use	√																																																																																																																																							
	Silvopasture																																																																																																																																								
	Sokshing																																																																																																																																								
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																								
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
>50	Drashing	29	1	100	69																																																																																																																																				
	Firewood	130	3		325																																																																																																																																				
30-49	Cham	917	24	85	941																																																																																																																																				
	Firewood	917	24		801																																																																																																																																				
20-29	Tsim	1707	44	95	690																																																																																																																																				
	Firewood	996	26		300																																																																																																																																				
10-19	Poles, etc.	5138	134	100	607																																																																																																																																				
	Firewood	4347	113		304																																																																																																																																				
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																								
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																												
Planting																																																																																																																																									
Thinning	38.4	100%																																																																																																																																							
Felling																																																																																																																																									
Assessment carried out by				SWS										Year:	2019																																																																																																																										

Sub-Compartment Record															
Geog	Sakteng	Comp.	2Tsemorong-Tsemotse	Sub-Comp.	Nathengtse	No.	i								
Areas in ha															
Non Forest Area	10.4	Protection	1.2	In-operable	31.4	Production	55.8								
Forest Composition and Description															
Maximum plots falls in hardwood forest with average condition of natural stand. Overall age class was matured with closed canopy.						Stand data									
						Bas. Area (m2/ha)		7.6							
						Tot. Vol. (m3/ha)		57.4							
		Vconifer %		12%											
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S			
						Hemlock		Plantation		Type	%	%			
						Fir	31	Natural	100	Firewood		100			
						Spruce		Coppice		Bamboo		56			
						Mixed Conifer		Canopy	%	Cane					
						Blue Pine		Dense	13	Daphne		6			
						Chir Pine		Closed	56						
						Hardwood	69	Open	31						
						Mixed H/C		Unstocked		Forest Use	I	E			
						Age Class	%	Condition	%	Type	%	%			
						Young	6	Good	6	Grazing	13	88			
						Immature	6	Average	88	Shokshing					
						Mature	88	Poor	6	Lopping					
						Overmature		Site Characteristics							
						Slope	%	Erosiveness	%	Soil Cover	%				
Gentle		Stable	38	High											
Moderate	38	Moderate	63	Moderate	69										
Steep	63	Unstable		Low	31										
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%		
Beilschmiedia spp.															
Cinnamomum spp.			14	3	4	3						24	28		
Exbucklandia															
Litsea spp.															
Michelia spp.															
Persea spp.															
Quercus spp.			7	3	3	2	1	0				15	19		
Schima spp.															
Walnut															
Other Broadleave	309	287		15	12	10	3	0	1			41	49		
Conifer spp.						2	1	1				3	4		
Total	309	287	21	20	18	17	4	2	1			83	100		
Future Management & Monitoring of Activities															
Manag. Option	No activities	√													
	Improvement														
	Timber Use														
	Firewood Use														
	Silvopasture														
	Sokshing														
Production Potential (N, Volume)				No of trees removed each year										Total	%
Product size	N total	N/ha	% (m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing														
	Firewood	330	6	94	815										
30-49	Cham	160	3	98	156										
	Firewood	1776	32	98	1694										
20-29	Tsim	284	5	100	77										
	Firewood	853	15	100	233										
10-19	Poles, etc.	395	7	100	32										
	Firewood	790	14	100	62										
Silvicultural Measures				Area in ha implemented per year										Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting															
Thinning															
Felling															
Assessment carried out by		SWS										Year:	2019		

Sub-Compartment Record																
Geog	Sakteng	Comp.	βTaksarjuk-Tshorphurong	Sub-Comp.	Taksarjuk	No.	a									
Areas in ha																
Non Forest Area	7.2	Protection	3.6	In-operable	25.0	Production	64.4									
Forest Composition and Description																
Hardwood forest with age class ranging from young to mature stands. Abundant fallen trees for firewood were available.						Stand data										
						Bas. Area (m2/ha)	14.9									
						Volume (m3/ha)	75.2									
						Volume conifer %	1%									
<p>Number of trees/ha by diameter class (dbh>10cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood	94	6				
						Spruce		Coppice		Bamboo						
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	44	Daphne	33					
						Chir Pine		Closed	11							
						Hardwood	94	Open	28							
						Mixed H/C	6	Unstocked	17	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	28	Good	33	Grazing	39	61				
						Immature	22	Average	61	Shokshing						
						Mature	50	Poor	6	Lopping						
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	% %					
Gentle	33	Stable	33	High	11											
Moderate	39	Moderate	50	Moderate	83											
Steep	28	Unstable	17	Low	6											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine			13									13	2			
Hemlock																
Spruce																
Fir																
Other Conifers																
Oak			151	20	1							172	30			
Acer																
Betula																
Rhododendron	20		6	5								11	2			
Other Broadleaves		39	289	84	13	1						386	66			
Total	20	39	459	109	14	1						582	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Thinning needed for matured stand.													
	Improvement	√														
	Timber Use															
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year											Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50																
Drashing			###													
Firewood																
30-49																
Cham			68													
Firewood	640	10		457												
20-29																
Tsim			75													
Firewood	5245	81		1477												
10-19																
Poles, etc.	405	6	79	34												
Firewood	23069	358		1713												
Silvicultural Measures				Area in ha implemented per year											Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	50.1	78%														
Felling																
Assessment carried out by		SWS											Year:	2019		

Sub-Compartment Record																																																																																																																																									
Geog	Sakteng	Comp.	Taksarjuk-Tshoephurong	Sub-Comp.	Tholong-Mangdina	No.	b																																																																																																																																		
Areas in ha																																																																																																																																									
Non Forest Area	16.6	Protection	2.2	In-operable	24.8	Production	52.8																																																																																																																																		
Forest Composition and Description																																																																																																																																									
Hardwood forest mostly matured stands.						Stand data																																																																																																																																			
						Bas. Area (m2/ha)	22.0																																																																																																																																		
						Tot. Vol. (m3/ha)	238.2																																																																																																																																		
						Vconifer %																																																																																																																																			
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Persea spp.			7	2	7	5	3	1	1	0		26	7																																																																																																																												
Quercus spp.			13		6	4	3	1	0		3	31	9																																																																																																																												
Schima spp.			20	12	9	3						43	12																																																																																																																												
Walnut			2		1	0	0	0				5	1																																																																																																																												
Other Broadleave	270	479	113	62	26	8	6	2	1	1	4	223	61																																																																																																																												
Conifer spp.																																																																																																																																									
Total	270	479	186	79	48	23	14	4	2	1	7	364	100																																																																																																																												
Future Management & Monitoring of Activities																																																																																																																																									
Manag. Option	No activities		The activities like thinning and felling can be carried out to meet the demand of timber and firewood.																																																																																																																																						
	Improvement	√																																																																																																																																							
	Timber Use	√																																																																																																																																							
	Firewood Use	√																																																																																																																																							
	Silvopasture																																																																																																																																								
	Sokshing																																																																																																																																								
Production Potential (N, Volume)					No of trees removed each year										Total	%																																																																																																																									
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
>50	Drashing	461	9	43	2186																																																																																																																																				
	Firewood	185	4		456																																																																																																																																				
30-49	Cham	1321	25	74	1276																																																																																																																																				
	Firewood	1448	27		1240																																																																																																																																				
20-29	Tsim	632	12	85	182																																																																																																																																				
	Firewood	2909	55		799																																																																																																																																				
10-19	Poles, etc.	3513	67	89	263																																																																																																																																				
	Firewood	5270	100		385																																																																																																																																				
Silvicultural Measures					Area in ha implemented per year										Total	%																																																																																																																									
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting																																																																																																																																									
Thinning	15.5	29%																																																																																																																																							
Felling	21.7	41%																																																																																																																																							
Assessment carried out by		SWS										Year:	2019																																																																																																																												

Sub-Compartment Record																																																																																																																																							
Geog	Sakteng	Comp.	βTaksarjuk-Tshorphurong	Sub-Comp.	Mangdinatse	No.	c																																																																																																																																
Areas in ha																																																																																																																																							
Non Forest Area	0.4	Protection	0.4	In-operable	2.4	Production	57.8																																																																																																																																
Forest Composition and Description																																																																																																																																							
Forest type is hardwood and dominated by open canopy. The forest is composed of all age classes.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)	9.8																																																																																																																																
						Tot. Vol. (m3/ha)	125.3																																																																																																																																
						Vconifer %																																																																																																																																	
					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>46</td> <td>42</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>4</td> <td>8</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td></td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>21</td> <td>Daphne</td> <td>46</td> <td>42</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>25</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>38</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>17</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td>25</td> <td>Good</td> <td>33</td> <td>Grazing</td> <td>29</td> <td>67</td> </tr> <tr> <td>Immature</td> <td>29</td> <td>Average</td> <td>54</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>29</td> <td>Poor</td> <td>13</td> <td>Lopping</td> <td>50</td> <td>21</td> </tr> <tr> <td>Overmature</td> <td>17</td> <td>Site Characteristics</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>42</td> <td>Stable</td> <td>33</td> <td>High</td> <td colspan="2">8</td> </tr> <tr> <td>Moderate</td> <td>42</td> <td>Moderate</td> <td>50</td> <td>Moderate</td> <td colspan="2">79</td> </tr> <tr> <td>Steep</td> <td>17</td> <td>Unstable</td> <td>17</td> <td>Low</td> <td colspan="2">13</td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood	46	42	Spruce		Coppice		Bamboo	4	8	Mixed Conifer		Canopy		Cane			Blue Pine		Dense	21	Daphne	46	42	Chir Pine		Closed	25				Hardwood	100	Open	38				Mixed H/C		Unstocked	17	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young	25	Good	33	Grazing	29	67	Immature	29	Average	54	Shokshing			Mature	29	Poor	13	Lopping	50	21	Overmature	17	Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	42	Stable	33	High	8		Moderate	42	Moderate	50	Moderate	79		Steep	17	Unstable	17	Low	13	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																	
Hemlock		Plantation		Type	%	%																																																																																																																																	
Fir		Natural	100	Firewood	46	42																																																																																																																																	
Spruce		Coppice		Bamboo	4	8																																																																																																																																	
Mixed Conifer		Canopy		Cane																																																																																																																																			
Blue Pine		Dense	21	Daphne	46	42																																																																																																																																	
Chir Pine		Closed	25																																																																																																																																				
Hardwood	100	Open	38																																																																																																																																				
Mixed H/C		Unstocked	17	Forest Use	I	E																																																																																																																																	
Age Class	%	Condition	%	Type	%	%																																																																																																																																	
Young	25	Good	33	Grazing	29	67																																																																																																																																	
Immature	29	Average	54	Shokshing																																																																																																																																			
Mature	29	Poor	13	Lopping	50	21																																																																																																																																	
Overmature	17	Site Characteristics																																																																																																																																					
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																		
Gentle	42	Stable	33	High	8																																																																																																																																		
Moderate	42	Moderate	50	Moderate	79																																																																																																																																		
Steep	17	Unstable	17	Low	13																																																																																																																																		
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																											
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Beilschmiedia spp.																																																																																																																																							
Cinnamomum spp.																																																																																																																																							
Exbucklandia																																																																																																																																							
Litsea spp.																																																																																																																																							
Michelia spp.																																																																																																																																							
Persea spp.																																																																																																																																							
Quercus spp.			9	20	10	2	1			0	5	48	17																																																																																																																										
Schima spp.																																																																																																																																							
Walnut				5	1							6	2																																																																																																																										
Other Broadleave			156	66	4							226	81																																																																																																																										
Conifer spp.																																																																																																																																							
Total			165	92	15	2	1			0	5	280	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities		The overmatured Quercus species can be felled for firewood.																																																																																																																																				
	Improvement	√																																																																																																																																					
	Timber Use																																																																																																																																						
	Firewood Use	√																																																																																																																																					
	Silvopasture																																																																																																																																						
	Sokshing																																																																																																																																						
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																						
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
>50	Drashing		100																																																																																																																																				
	Firewood	373	6	4255																																																																																																																																			
30-49	Cham		61																																																																																																																																				
	Firewood	591	10	514																																																																																																																																			
20-29	Tsim	294	5	80																																																																																																																																			
	Firewood	3826	66	1095																																																																																																																																			
10-19	Poles, etc.		71																																																																																																																																				
	Firewood	6813	118	481																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																						
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
Planting																																																																																																																																							
Thinning	9.6	17%																																																																																																																																					
Felling	24.1	42%																																																																																																																																					
Assessment carried out by		SWS												Year:	2019																																																																																																																								

Sub-Compartment Record																
Geog	Sakteng	Comp.	Taksarjuk-Tshorbphuron	Sub-Comp.	Bronmatse	No.	d									
Areas in ha																
Non Forest Area	16.6	Protection	26.6	In-operable	73.5	Production	3.1									
Forest Composition and Description																
Hardwood forest with closed canopy and mostly matured stand. Grazing and lopping were extensive.						Stand data										
						Bas. Area (m2/ha)	16.0									
						Volume (m3/ha)	124.4									
						Volume conifer %	79%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood		100				
						Spruce		Coppice		Bamboo		100				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense		Daphne		100				
						Chir Pine		Closed	100							
						Hardwood	100	Open								
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good		Grazing		100				
						Immature		Average	100	Shokshing						
						Mature	100	Poor		Lopping		100				
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
						Gentle	100	Stable		High						
						Moderate		Moderate	100	Moderate	100					
						Steep		Unstable		Low						
Species		Height	N/ha per diameter class										Total (> 10cm)			
		0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%		
Chirpine																
Bluepine																
Hemlock					21		8		9	4		42	14			
Spruce																
Fir																
Other Conifers																
Oak																
Acer																
Betula																
Rhododendron				41								41	13			
Other Broadleaves			226									226	73			
Total			226	41	21		8		9	4		309	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities		Dead and fallen trees can be allotted as firewood.													
	Improvement	√														
	Timber Use															
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)					No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
> 50	Drashing	40	13	62	124											
	Firewood															
30-49	Cham															
	Firewood	64	21	100	47											
20-29	Tsim															
	Firewood	125	41	100	29											
10-19	Poles, etc.															
	Firewood	694	226	100	49											
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting	3.1	100%														
Thinning																
Felling																
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																	
Geog	Sakteng	Comp.	βTaksarjuk-Tshorphurong	Sub-Comp.	Nathengjuk	No.	e										
Areas in ha																	
Non Forest Area	9.8	Protection	20.0	In-operable	47.0	Production	22.1										
Forest Composition and Description																	
Forest cover is dominated by mixed H/C and canopy cover mostly densed. The sub-compartment has stand composed of all age classes.						Stand data											
						Bas. Area (m2/ha)	16.0										
						Volume (m3/ha)	109.1										
						Volume conifer %	72%										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir	13	Natural	100	Firewood	38	50					
						Spruce		Coppice		Bamboo	63	38					
						Mixed Conifer	13	Canopy		Cane							
						Blue Pine		Dense	38	Daphne	75	25					
						Chir Pine		Closed	25								
						Hardwood		Open	13								
						Mixed H/C	75	Unstocked	25	Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young	25	Good	25	Grazing	50	50					
						Immature	25	Average	38	Shokshing							
						Mature	38	Poor	38	Lopping	13						
						Overmature	13	Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	% %						
Gentle		Stable	13	High	25												
Moderate	63	Moderate	38	Moderate	50												
Steep	38	Unstable	50	Low	25												
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine	133	221	28	25	8							62	20				
Hemlock		44	14	25	13	9	3	3		0		69	22				
Spruce																	
Fir			14	5								19	6				
Other Conifers			42	10								53	17				
Oak																	
Acer																	
Betula																	
Rhododendron	442	442		46	8							54	17				
Other Broadleaves	221	177	28	10	16							54	17				
Total	796	884	127	122	44	9	3	3		0		310	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities		Blue pine and hemlock species can be felled for timber.														
	Improvement																
	Timber Use	√															
	Firewood Use																
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	97	4	66	273												
	Firewood																
49	Cham	656	30	80	564												
30-49	Firewood	287	13		179												
20-29	Tsim	1126	51	88	376												
20-29	Firewood	1239	56		310												
10-19	Poles, etc.			56													
10-19	Firewood	1564	71		125												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning																	
Felling	16.6	75%															
Assessment carried out by		SWS												Year:	2019		

Sub-Compartment Record																	
Geog	Sakteng	Comp.	βTaksarjuk-Tshorphurong	Sub-Comp.	Nyakshithe	No.	f										
Areas in ha																	
Non Forest Area	7.9	Protection	19.0	In-operable	64.9	Production	12.4										
Forest Composition and Description																	
The forest type is mixed H/C. The slope and soil cover are moderate.							Stand data										
							Bas. Area (m2/ha)	17.5									
							Volume (m3/ha)	121.5									
							Volume conifer %	57%									
							Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
							Hemlock	25	Plantation		Type	%	%				
							Fir		Natural	100	Firewood		100				
							Spruce		Coppice		Bamboo	25					
							Mixed Conifer		Canopy	%	Cane						
							Blue Pine		Dense		Daphne		25				
							Chir Pine		Closed	50							
							Hardwood		Open	50							
							Mixed H/C	75	Unstocked		Forest Use	I	E				
							Age Class	%	Condition	%	Type	%	%				
							Young		Good		Grazing		75				
							Immature		Average	50	Shokshing						
							Mature	100	Poor	50	Lopping		50				
							Overmature		Site Characteristics								
							Slope	%	Erosiveness	%	Soil Cover	%					
Gentle		Stable	25	High													
Moderate	75	Moderate	75	Moderate	100												
Steep	25	Unstable		Low													
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Chirpine																	
Bluepine																	
Hemlock	265	177	226	41		9			5			281	60				
Spruce																	
Fir																	
Other Conifers																	
Oak																	
Acer				31	5	3	2					41	9				
Betula	177								1			1	0				
Rhododendron	1503	796	57	10								67	14				
Other Broadleaves			57	10	5	3	2					77	17				
Total	1945	973	340	92	10	16	4		6			467	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	Thinning for firewood and poles.															
	Improvement																
	Timber Use																
	Firewood Use	√															
	Silvopasture																
	Sokshing																
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
>50	Drashing	42	3	89	198												
	Firewood	66	5		174												
30-49	Cham	78	6	68	106												
	Firewood	142	11		144												
20-29	Tsim	630	51	89	209												
	Firewood	378	31		105												
10-19	Poles, etc.	2100	170	83	196												
	Firewood	1400	113		96												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning	3.1	25%															
Felling																	
Assessment carried out by				SWS										Year:	2019		

Sub-Compartment Record																																																																																																																																														
Geog	Sakteng	Comp.	βTaksarjuk-Tshorphurong	Sub-Comp.	Natheng	No.	g																																																																																																																																							
Areas in ha																																																																																																																																														
Non Forest Area	8.1	Protection	5.3	In-operable	75.7	Production	6.6																																																																																																																																							
Forest Composition and Description																																																																																																																																														
Composed of mixed conifer and mixed H/C forest having poor stock of trees.						Stand data																																																																																																																																								
						Bas. Area (m2/ha)	17.0																																																																																																																																							
						Volume (m3/ha)	116.3																																																																																																																																							
						Volume conifer %	78%																																																																																																																																							
					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td>100</td> <td></td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>50</td> <td>50</td> </tr> <tr> <td>Mixed Conifer</td> <td>50</td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td>50</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>50</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td></td> <td>Open</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td>50</td> <td>Unstocked</td> <td>50</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td></td> <td>Grazing</td> <td></td> <td>50</td> </tr> <tr> <td>Immature</td> <td>50</td> <td>Average</td> <td>100</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>50</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th colspan="7">Site Characteristics</th> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2"></th> </tr> <tr> <td>Gentle</td> <td>50</td> <td>Stable</td> <td>50</td> <td>High</td> <td colspan="2"></td> </tr> <tr> <td>Moderate</td> <td>50</td> <td>Moderate</td> <td>50</td> <td>Moderate</td> <td colspan="2">100</td> </tr> <tr> <td>Steep</td> <td></td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2"></td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood	100		Spruce		Coppice		Bamboo	50	50	Mixed Conifer	50	Canopy	%	Cane			Blue Pine		Dense		Daphne		50	Chir Pine		Closed	50				Hardwood		Open					Mixed H/C	50	Unstocked	50	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good		Grazing		50	Immature	50	Average	100	Shokshing			Mature	50	Poor		Lopping			Overmature							Site Characteristics							Slope	%	Erosiveness	%	Soil Cover			Gentle	50	Stable	50	High			Moderate	50	Moderate	50	Moderate	100		Steep		Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																								
Hemlock		Plantation		Type	%	%																																																																																																																																								
Fir		Natural	100	Firewood	100																																																																																																																																									
Spruce		Coppice		Bamboo	50	50																																																																																																																																								
Mixed Conifer	50	Canopy	%	Cane																																																																																																																																										
Blue Pine		Dense		Daphne		50																																																																																																																																								
Chir Pine		Closed	50																																																																																																																																											
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Mixed H/C	50	Unstocked	50	Forest Use	I	E																																																																																																																																								
Age Class	%	Condition	%	Type	%	%																																																																																																																																								
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Immature	50	Average	100	Shokshing																																																																																																																																										
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Gentle	50	Stable	50	High																																																																																																																																										
Moderate	50	Moderate	50	Moderate	100																																																																																																																																									
Steep		Unstable		Low																																																																																																																																										
Species	Height 0.3<1.3 m	N/ha per diameter class											Total (> 10cm)																																																																																																																																	
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																																	
Chirpine																																																																																																																																														
Bluepine																																																																																																																																														
Hemlock											1	1	0																																																																																																																																	
Spruce																																																																																																																																														
Fir				81	21							102	18																																																																																																																																	
Other Conifers			113	41								154	27																																																																																																																																	
Oak																																																																																																																																														
Acer																																																																																																																																														
Betula																																																																																																																																														
Rhododendron																																																																																																																																														
Other Broadleaves			283	20								303	54																																																																																																																																	
Total			396	143	21						1	561	100																																																																																																																																	
Future Management & Monitoring of Activities																																																																																																																																														
Manag. Option	No activities	√																																																																																																																																												
	Improvement																																																																																																																																													
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Production Potential (N, Volume)				No of trees removed each year																																																																																																																																										
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																														
>50	Drashing	9	1	100	121																																																																																																																																									
	Firewood																																																																																																																																													
30-49	Cham	68	10	100	60																																																																																																																																									
	Firewood	68	10	100	60																																																																																																																																									
20-29	Tsim	537	81	100	200																																																																																																																																									
	Firewood	402	61	100	128																																																																																																																																									
10-19	Poles, etc.			100																																																																																																																																										
	Firewood	2608	396	100	196																																																																																																																																									
Silvicultural Measures				Area in ha implemented per year																																																																																																																																										
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%																																																																																																																															
Planting																																																																																																																																														
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Assessment carried out by		SWS											Year:	2019																																																																																																																																

Sub-Compartment Record																
Geog	Sakteng	Comp.	Taksarjuk-Tshorpurong	Sub-Comp.	Tshorpurong	No.	h									
Areas in ha																
Non Forest Area	23.2	Protection	4.5	In-operable	28.8	Production	13.6									
Forest Composition and Description																
Most of the stand were immature and canopy closure ranges from 10 to 40%. The bamboo growth was found abundant.						Stand data										
						Bas. Area (m2/ha)	2.5									
						Volume (m3/ha)	15.6									
						Volume conifer %	73%									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation								
						Fir		Natural	100	Firewood	13	13				
						Spruce		Coppice		Bamboo	75					
						Mixed Conifer	63	Canopy		Cane						
						Blue Pine	38	Dense		Daphne						
						Chir Pine		Closed	13							
						Hardwood		Open	50							
						Mixed H/C		Unstocked	38	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young	25	Good		Grazing						
						Immature	63	Average	63	Shokshing						
						Mature	13	Poor	38	Lopping						
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	25	Stable	25	High												
Moderate	50	Moderate	50	Moderate	63											
Steep	25	Unstable	25	Low	38											
Species	Height	N/ha per diameter class										Total (> 10cm)				
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Chirpine																
Bluepine	88	88		15	3							18	28			
Hemlock																
Spruce																
Fir					3							3	4			
Other Conifers			28									28	44			
Oak																
Acer																
Betula																
Rhododendron																
Other Broadleaves				15								15	24			
Total	88	88	28	31	5							64	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	<input checked="" type="checkbox"/>	Need to protect the area since it is near to river buffer.													
	Improvement	<input type="checkbox"/>														
	Timber Use	<input type="checkbox"/>														
	Firewood Use	<input type="checkbox"/>														
	Silvopasture	<input type="checkbox"/>														
	Sokshing	<input type="checkbox"/>														
Production Potential (N, Volume)					No of trees removed each year										Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing			###												
	Firewood															
30-49	Cham	35	3	26												
	Firewood	35	3	100	31											
20-29	Tsim	138	10	67	44											
	Firewood	138	10	67	38											
10-19	Poles, etc.			100												
	Firewood	384	28	100	33											
Silvicultural Measures					Area in ha implemented per year										Total	%
Measure	Area (ha)	in %														
Planting																
Thinning																
Felling																
Assessment carried out by			SWS											Year:	2019	

Sub-Compartment Record																																																																																																																																								
Geog	Sakten	Comp.	4Kherilok-Tshonang	Sub-Comp.	Kherilok	No.	a																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	5.1	Protection	10.5	In-operable	22.2	Production	70.1																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Hardwood forest with densed canopy and has mostly matured stand in good conditions.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	23.3																																																																																																																																	
						Tot. Vol. (m3/ha)	560.9																																																																																																																																	
						Vconifer %																																																																																																																																		
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>100</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>26</td> <td>74</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>95</td> <td>Daphne</td> <td>5</td> <td>95</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>5</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>100</td> <td>Grazing</td> <td></td> <td>100</td> </tr> <tr> <td>Immature</td> <td></td> <td>Average</td> <td></td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>100</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td>53</td> </tr> <tr> <td>Overmature</td> <td></td> <td colspan="4">Site Characteristics</td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>16</td> <td>Stable</td> <td>53</td> <td>High</td> <td colspan="2">100</td> </tr> <tr> <td>Moderate</td> <td>58</td> <td>Moderate</td> <td>47</td> <td>Moderate</td> <td colspan="2"></td> </tr> <tr> <td>Steep</td> <td>26</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2"></td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood		100	Spruce		Coppice		Bamboo	26	74	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense	95	Daphne	5	95	Chir Pine		Closed	5				Hardwood	100	Open					Mixed H/C		Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	100	Grazing		100	Immature		Average		Shokshing			Mature	100	Poor		Lopping		53	Overmature		Site Characteristics						Slope	%	Erosiveness	%	Soil Cover	%		Gentle	16	Stable	53	High	100		Moderate	58	Moderate	47	Moderate			Steep	26	Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
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Fir		Natural	100	Firewood		100																																																																																																																																		
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Mixed Conifer		Canopy	%	Cane																																																																																																																																				
Blue Pine		Dense	95	Daphne	5	95																																																																																																																																		
Chir Pine		Closed	5																																																																																																																																					
Hardwood	100	Open																																																																																																																																						
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Age Class	%	Condition	%	Type	%	%																																																																																																																																		
Young		Good	100	Grazing		100																																																																																																																																		
Immature		Average		Shokshing																																																																																																																																				
Mature	100	Poor		Lopping		53																																																																																																																																		
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Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																			
Gentle	16	Stable	53	High	100																																																																																																																																			
Moderate	58	Moderate	47	Moderate																																																																																																																																				
Steep	26	Unstable		Low																																																																																																																																				
Species	Height	N/ha per diameter class										Total (> 10cm)																																																																																																																												
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																											
Beilschmiedia spp.																																																																																																																																								
Cinnamomum spp.		130			1							1	0																																																																																																																											
Exbucklandia																																																																																																																																								
Litsea spp.																																																																																																																																								
Michelia spp.										0		0	0																																																																																																																											
Persea spp.																																																																																																																																								
Quercus spp.	316	354		32	11	9	5	3	2	1	22	84	24																																																																																																																											
Schima spp.	149	298		4	4	5	1	2	1	0	9	27	8																																																																																																																											
Walnut																																																																																																																																								
Other Broadleave	689	931	137	51	23	9	8	2	1	1		232	67																																																																																																																											
Conifer spp.																																																																																																																																								
Total	1154	1713	137	88	39	23	15	6	4	2	31	344	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities	Thinning and felling recommended for firewood and timber.																																																																																																																																						
	Improvement																																																																																																																																							
	Timber Use	√																																																																																																																																						
	Firewood Use	√																																																																																																																																						
	Silvopasture																																																																																																																																							
Sokshing																																																																																																																																								
Production Potential (N, Volume)				No of trees removed each year										Total	%																																																																																																																									
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing	308	4	100	931																																																																																																																																			
	Firewood	3696	53		31925																																																																																																																																			
30-49	Cham	723	10		586																																																																																																																																			
	Firewood	3619	52	100	3408																																																																																																																																			
20-29	Tsim			88																																																																																																																																				
	Firewood	5415	77		1609																																																																																																																																			
10-19	Poles, etc.			87																																																																																																																																				
	Firewood	8357	119		587																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year										Total	%																																																																																																																									
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting																																																																																																																																								
Thinning	33.2	47%																																																																																																																																						
Felling	36.9	53%																																																																																																																																						
Assessment carried out by	SWS											Year:	2019																																																																																																																											

Sub-Compartment Record																																																																																																																																							
Geog	Sakteng	Comp.	4Kherlok-Tshonang	Sub-Comp.	Brayteng	No.	b																																																																																																																																
Areas in ha																																																																																																																																							
Non Forest Area	1.2	Protection	1.3	In-operable	39.8	Production	59.7																																																																																																																																
Forest Composition and Description																																																																																																																																							
Dominated by mixed H/C forest type followed by hardwood. The stands were matured with mostly open canopy.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)	15.5																																																																																																																																
						Tot. Vol. (m3/ha)	225.5																																																																																																																																
						Vconifer %																																																																																																																																	
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>87</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>7</td> <td>47</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td></td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td>7</td> <td>20</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>27</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>13</td> <td>Open</td> <td>40</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td>87</td> <td>Unstocked</td> <td>33</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>27</td> <td>Grazing</td> <td>87</td> <td>6.7</td> </tr> <tr> <td>Immature</td> <td></td> <td>Average</td> <td>53</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>100</td> <td>Poor</td> <td>20</td> <td>Lopping</td> <td>60</td> <td>20</td> </tr> <tr> <td>Overmature</td> <td></td> <td>Site Characteristics</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>33</td> <td>Stable</td> <td>67</td> <td>High</td> <td colspan="2">20</td> </tr> <tr> <td>Moderate</td> <td>33</td> <td>Moderate</td> <td>33</td> <td>Moderate</td> <td colspan="2">67</td> </tr> <tr> <td>Steep</td> <td>33</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2">13</td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood		87	Spruce		Coppice		Bamboo	7	47	Mixed Conifer		Canopy		Cane			Blue Pine		Dense		Daphne	7	20	Chir Pine		Closed	27				Hardwood	13	Open	40				Mixed H/C	87	Unstocked	33	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	27	Grazing	87	6.7	Immature		Average	53	Shokshing			Mature	100	Poor	20	Lopping	60	20	Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	33	Stable	67	High	20		Moderate	33	Moderate	33	Moderate	67		Steep	33	Unstable		Low	13	
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																	
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Chir Pine		Closed	27																																																																																																																																				
Hardwood	13	Open	40																																																																																																																																				
Mixed H/C	87	Unstocked	33	Forest Use	I	E																																																																																																																																	
Age Class	%	Condition	%	Type	%	%																																																																																																																																	
Young		Good	27	Grazing	87	6.7																																																																																																																																	
Immature		Average	53	Shokshing																																																																																																																																			
Mature	100	Poor	20	Lopping	60	20																																																																																																																																	
Overmature		Site Characteristics																																																																																																																																					
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																		
Gentle	33	Stable	67	High	20																																																																																																																																		
Moderate	33	Moderate	33	Moderate	67																																																																																																																																		
Steep	33	Unstable		Low	13																																																																																																																																		
Species	Height	N/ha per diameter class										Total (> 10cm)																																																																																																																											
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Beilschmiedia spp.																																																																																																																																							
Cinnamomum spp.			30	3	3	6	1		0			43	24																																																																																																																										
Exbucklandia																																																																																																																																							
Litsea spp.																																																																																																																																							
Michelia spp.					3							3	2																																																																																																																										
Persea spp.		24		14	3	5	2	1	0			24	14																																																																																																																										
Quercus spp.	94	94				4	6	3	1		6	20	11																																																																																																																										
Schima spp.																																																																																																																																							
Walnut		24									3	3	1																																																																																																																										
Other Broadleave	613	849	38	19	15	7	2	2	2	1		85	48																																																																																																																										
Conifer spp.																																																																																																																																							
Total	707	990	68	35	24	22	11	6	3	1	8	178	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities		Thinning is recommended.																																																																																																																																				
	Improvement	√																																																																																																																																					
	Timber Use	√																																																																																																																																					
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	Silvopasture																																																																																																																																						
	Sokshing																																																																																																																																						
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																						
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
>50	Drashing	564	9	84	6442																																																																																																																																		
	Firewood	892	15		2687																																																																																																																																		
30-49	Cham	681	11	86	668																																																																																																																																		
	Firewood	1643	28		1536																																																																																																																																		
20-29	Tsim	973	16	92	277																																																																																																																																		
	Firewood	973	16		284																																																																																																																																		
10-19	Poles, etc.	1351	23	89	106																																																																																																																																		
	Firewood	2252	38		158																																																																																																																																		
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																						
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
Planting																																																																																																																																							
Thinning	15.9	27%																																																																																																																																					
Felling	11.9	20%																																																																																																																																					
Assessment carried out by		SWS												Year:	2019																																																																																																																								

Sub-Compartment Record															
Geog	Sakteng	Comp.	4Kherilok-Tshonang	Sub-Comp.	Najab	No.	c								
Areas in ha															
Non Forest Area	1.7	Protection	6.8	In-operable	54.9	Production	36.6								
Forest Composition and Description															
Stands were matured and some parts of the area were inoperable since it falls in steep area and some were near the grazing land.						Stand data									
						Bas. Area (m2/ha)	23.0								
						Tot. Vol. (m3/ha)	301.8								
						Vconifer %									
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S			
						Hemlock		Plantation		Type	%	%			
						Fir		Natural	100	Firewood		100			
						Spruce		Coppice		Bamboo	10	60			
						Mixed Conifer		Canopy	%	Cane					
						Blue Pine		Dense	10	Daphne	10	50			
						Chir Pine		Closed	20						
						Hardwood	20	Open	20						
						Mixed H/C	80	Unstocked	50	Forest Use	I	E			
						Age Class	%	Condition	%	Type	%	%			
						Young		Good	20	Grazing	70	20			
						Immature	30	Average	50	Shokshing					
						Mature	70	Poor	30	Lopping	70	20			
						Overmature		Site Characteristics							
						Slope	%	Erosiveness	%	Soil Cover	%				
Gentle	20	Stable	20	High	30										
Moderate	40	Moderate	80	Moderate	70										
Steep	40	Unstable		Low											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)			
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%		
Beilschmiedia spp.															
Cinnamomum spp.						1		1		0	2	5	1		
Exbucklandia															
Litsea spp.															
Michelia spp.					2						1	3	1		
Persea spp.				20	8	14	3	1	0			46	14		
Quercus spp.	106	177	23	8	10	11	5	5	1	1	7	72	22		
Schima spp.	71	71													
Walnut		35			2							2	1		
Other Broadleave	672	531	136	37	15	9	2	2		1		200	61		
Conifer spp.															
Total	849	813	158	65	37	35	9	8	2	2	10	328	100		
Future Management & Monitoring of Activities															
Manag. Option	No activities	Thinning and felling recommended for firewood and timber.													
	Improvement														
	Timber Use	√													
	Firewood Use	√													
	Silvopasture														
	Sokshing														
Production Potential (N, Volume)				No of trees removed each year										Total	%
Product size	N total	N/ha	%	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50	Drashing	309	8	64	1853										
	Firewood	432	12		1533										
30-49	Cham	689	19	86	778										
	Firewood	1603	44		1622										
20-29	Tsim	447	12	88	127										
	Firewood	1640	45		474										
10-19	Poles, etc.	2071	57	86	145										
	Firewood	2900	79		204										
Silvicultural Measures				Area in ha implemented per year										Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Planting															
Thinning	3.7	10%													
Felling	7.3	20%													
Assessment carried out by		SWS										Year:	2019		

Sub-Compartment Record																																																																																																																																							
Geog	Sakteng	Comp.	4Kherilok-Tshonang	Sub-Comp.	Najabjuk	No.	d																																																																																																																																
Areas in ha																																																																																																																																							
Non Forest Area	3.6	Protection	1.5	In-operable	33.9	Production	60.2																																																																																																																																
Forest Composition and Description																																																																																																																																							
Mixture of hardwood and mixed H/C forest with closed canopy. It has mostly matured stand followed by immature.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)		22.1																																																																																																																															
						Tot. Vol. (m3/ha)		211.7																																																																																																																															
		Vconifer %		14%																																																																																																																																			
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Michelia spp.										0		0	0																																																																																																																										
Persea spp.				23	6	4						33	11																																																																																																																										
Quercus spp.	486	486	8	9	4	3	3	1	2	3		33	10																																																																																																																										
Schima spp.																																																																																																																																							
Walnut																																																																																																																																							
Other Broadleave	508	928	120	51	26	9	4	1	1			213	68																																																																																																																										
Conifer spp.	243	265	14	5		6	4	3	1			32	10																																																																																																																										
Total	1238	1680	134	87	42	23	11	6	4	2	3	312	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities	Thinning for firewood recommended.																																																																																																																																					
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Production Potential (N, Volume)				No of trees removed each year											Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
>50	Drashing	477	8	100	1359																																																																																																																																		
	Firewood	1100	18		5800																																																																																																																																		
30-49	Cham	331	6	80	398																																																																																																																																		
	Firewood	2763	46		2632																																																																																																																																		
20-29	Tsim	153	3	94	48																																																																																																																																		
	Firewood	4754	79		1366																																																																																																																																		
10-19	Poles, etc.			79																																																																																																																																			
	Firewood	6390	106		449																																																																																																																																		
Silvicultural Measures				Area in ha implemented per year											Total	%																																																																																																																							
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
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Areas in ha																																																																																																																																								
Non Forest Area		Protection	6.8	In-operable	84.6	Production	7.4																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Hardwood forest with poor timber stock.						Stand data																																																																																																																																		
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Walnut																																																																																																																																								
Other Broadleave	177	1238			31	6						37	100																																																																																																																											
Conifer spp.																																																																																																																																								
Total	177	1238			31	6						37	100																																																																																																																											
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Production Potential (N, Volume)					No of trees removed each year										Total	%																																																																																																																								
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
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	Firewood	153	21	55	100																																																																																																																																			
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Planting	3.7	50%																																																																																																																																						
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Sub-Compartment Record																																																																																																																																								
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Areas in ha																																																																																																																																								
Non Forest Area	0.4	Protection	5.0	In-operable	46.1	Production	50.0																																																																																																																																	
Forest Composition and Description																																																																																																																																								
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						Tot. Vol. (m3/ha)	198.0																																																																																																																																	
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Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																		
Hemlock		Plantation		Type	%	%																																																																																																																																		
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Age Class	%	Condition	%	Type	%	%																																																																																																																																		
Young		Good	23	Grazing		100																																																																																																																																		
Immature	23	Average	77	Shokshing																																																																																																																																				
Mature	77	Poor		Lopping		100																																																																																																																																		
Overmature		Site Characteristics																																																																																																																																						
Slope	%	Erosiveness	%	Soil Cover	%	%																																																																																																																																		
Gentle	23	Stable	23	High		62																																																																																																																																		
Moderate	77	Moderate	77	Moderate		38																																																																																																																																		
Steep		Unstable		Low																																																																																																																																				
Species	Height	N/ha per diameter class										Total (> 10cm)																																																																																																																												
	0.3<1.3 m	<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																											
Beilschmiedia spp.																																																																																																																																								
Cinnamomum spp.																																																																																																																																								
Exbucklandia																																																																																																																																								
Litsea spp.																																																																																																																																								
Michelia spp.																																																																																																																																								
Persea spp.																																																																																																																																								
Quercus spp.	326	381		41	27	10	8	3				89	18																																																																																																																											
Schima spp.																																																																																																																																								
Walnut																																																																																																																																								
Other Broadleave	626	762	157	81	29	10	6	5	2			290	58																																																																																																																											
Conifer spp.	326	435	96	16	3		2	1				118	24																																																																																																																											
Total	1279	1578	252	138	59	19	16	9	2			496	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities	Thinning recommended for firewood.																																																																																																																																						
	Improvement																																																																																																																																							
	Timber Use																																																																																																																																							
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	Silvopasture																																																																																																																																							
	Sokshing																																																																																																																																							
Production Potential (N, Volume)				No of trees removed each year												Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
>50	Drashing	143	3	100	365																																																																																																																																			
	Firewood	1228	25		3319																																																																																																																																			
30-49	Cham			96																																																																																																																																				
	Firewood	3764	75		3314																																																																																																																																			
20-29	Tsim			75																																																																																																																																				
	Firewood	5168	103		1522																																																																																																																																			
10-19	Poles, etc.			28																																																																																																																																				
	Firewood	3480	70		244																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year												Total	%																																																																																																																							
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																											
Planting																																																																																																																																								
Thinning	50.0	100%																																																																																																																																						
Felling																																																																																																																																								
Assessment carried out by				SWS										Year:	2019																																																																																																																									

Sub-Compartment Record																
Geog	Sakteng	Comp.	4Kherilok-Tshonang	Sub-Comp.	Tshonang	No.	h									
Areas in ha																
Non Forest Area	1.3	Protection	7.7	In-operable	48.5	Production	27.3									
Forest Composition and Description																
Hardwood forest type with open canopy. Firewood, bamboo and daphne were sparsely present.						Stand data										
						Bas. Area (m2/ha)		9.8								
						Tot. Vol. (m3/ha)		54.1								
Vconifer %																
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood		100				
						Spruce		Coppice		Bamboo		100				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense		Daphne		67				
						Chir Pine		Closed	11							
						Hardwood	89	Open	78							
						Mixed H/C	11	Unstocked	11	Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good		Grazing	44	56				
						Immature	33	Average	78	Shokshing						
						Mature	67	Poor	22	Lopping		67				
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover						
Gentle	22	Stable	33	High												
Moderate	44	Moderate	67	Moderate	44											
Steep	33	Unstable		Low	56											
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)				
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%			
Beilschmiedia spp.																
Cinnamomum spp.																
Exbucklandia																
Litsea spp.																
Michelia spp.																
Persea spp.																
Quercus spp.																
Schima spp.																
Walnut																
Other Broadleave	1100	1454	189	68	18	8						283	100			
Conifer spp.																
Total	1100	1454	189	68	18	8						283	100			
Future Management & Monitoring of Activities																
Manag. Option	No activities	Thinning for firewood is recommended.														
	Improvement															
	Timber Use															
	Firewood Use															
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year										Total	%	
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
>50			###													
30-49			72	435												
20-29			33	167												
10-19			53	24												
				169												
Silvicultural Measures				Area in ha implemented per year										Total	%	
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
Planting																
Thinning	3.0	11%														
Felling																
Assessment carried out by		SWS										Year:	2019			

Sub-Compartment Record																																																																																																																																							
Geog	Sakteng	Comp.	5Moelamthung-Barmatoo	Sub-Comp.	Moelamthung	No.	a																																																																																																																																
Areas in ha																																																																																																																																							
Non Forest Area	3.1	Protection	4.7	In-operable	71.7	Production	22.6																																																																																																																																
Forest Composition and Description																																																																																																																																							
Forest type is hardwood with immature stand and canopy cover varying from 10% to 40%.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)	11.0																																																																																																																																
						Tot. Vol. (m3/ha)	64.4																																																																																																																																
						Vconifer %																																																																																																																																	
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>					<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td>100</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td></td> <td>Firewood</td> <td></td> <td>83</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>33</td> <td>33</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td></td> <td>50</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>33</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>50</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>17</td> <td>Forest Use</td> <td>I</td> <td>E</td> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td></td> <td>Grazing</td> <td></td> <td>33</td> </tr> <tr> <td>Immature</td> <td>83</td> <td>Average</td> <td>100</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>17</td> <td>Poor</td> <td></td> <td>Lopping</td> <td></td> <td></td> </tr> <tr> <td>Overmature</td> <td></td> <td>Site Characteristics</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td></td> <td>Stable</td> <td></td> <td>High</td> <td colspan="2">17</td> </tr> <tr> <td>Moderate</td> <td></td> <td>Moderate</td> <td>100</td> <td>Moderate</td> <td colspan="2">83</td> </tr> <tr> <td>Steep</td> <td>100</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2"></td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation	100	Type	%	%	Fir		Natural		Firewood		83	Spruce		Coppice		Bamboo	33	33	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne		50	Chir Pine		Closed	33				Hardwood	100	Open	50				Mixed H/C		Unstocked	17	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good		Grazing		33	Immature	83	Average	100	Shokshing			Mature	17	Poor		Lopping			Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle		Stable		High	17		Moderate		Moderate	100	Moderate	83		Steep	100	Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																	
Hemlock		Plantation	100	Type	%	%																																																																																																																																	
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Blue Pine		Dense		Daphne		50																																																																																																																																	
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Immature	83	Average	100	Shokshing																																																																																																																																			
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Moderate		Moderate	100	Moderate	83																																																																																																																																		
Steep	100	Unstable		Low																																																																																																																																			
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																											
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Beilschmiedia spp.																																																																																																																																							
Cinnamomum spp.																																																																																																																																							
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Michelia spp.																																																																																																																																							
Persea spp.																																																																																																																																							
Quercus spp.	236	118	113	27	10	4	1					156	45																																																																																																																										
Schima spp.																																																																																																																																							
Walnut																																																																																																																																							
Other Broadleave	707	295	132	54	7							193	55																																																																																																																										
Conifer spp.																																																																																																																																							
Total	943	413	245	81	17	4	1					350	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities	Thinning for firewood and poles.																																																																																																																																					
	Improvement	√																																																																																																																																					
	Timber Use																																																																																																																																						
	Firewood Use	√																																																																																																																																					
	Silvopasture																																																																																																																																						
	Sokshing																																																																																																																																						
Production Potential (N, Volume)				No of trees removed each year											Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
>50																																																																																																																																							
Drashing																																																																																																																																							
Firewood																																																																																																																																							
30-49																																																																																																																																							
Cham			74																																																																																																																																				
Firewood	361	16		295																																																																																																																																			
20-29																																																																																																																																							
Tsim	461	20	75	134																																																																																																																																			
Firewood	922	41		259																																																																																																																																			
10-19																																																																																																																																							
Poles, etc.	1281	57	92	95																																																																																																																																			
Firewood	3842	170		288																																																																																																																																			
Silvicultural Measures				Area in ha implemented per year											Total	%																																																																																																																							
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
Planting																																																																																																																																							
Thinning	7.5	33%																																																																																																																																					
Felling																																																																																																																																							
Assessment carried out by		SWS											Year:	2019																																																																																																																									

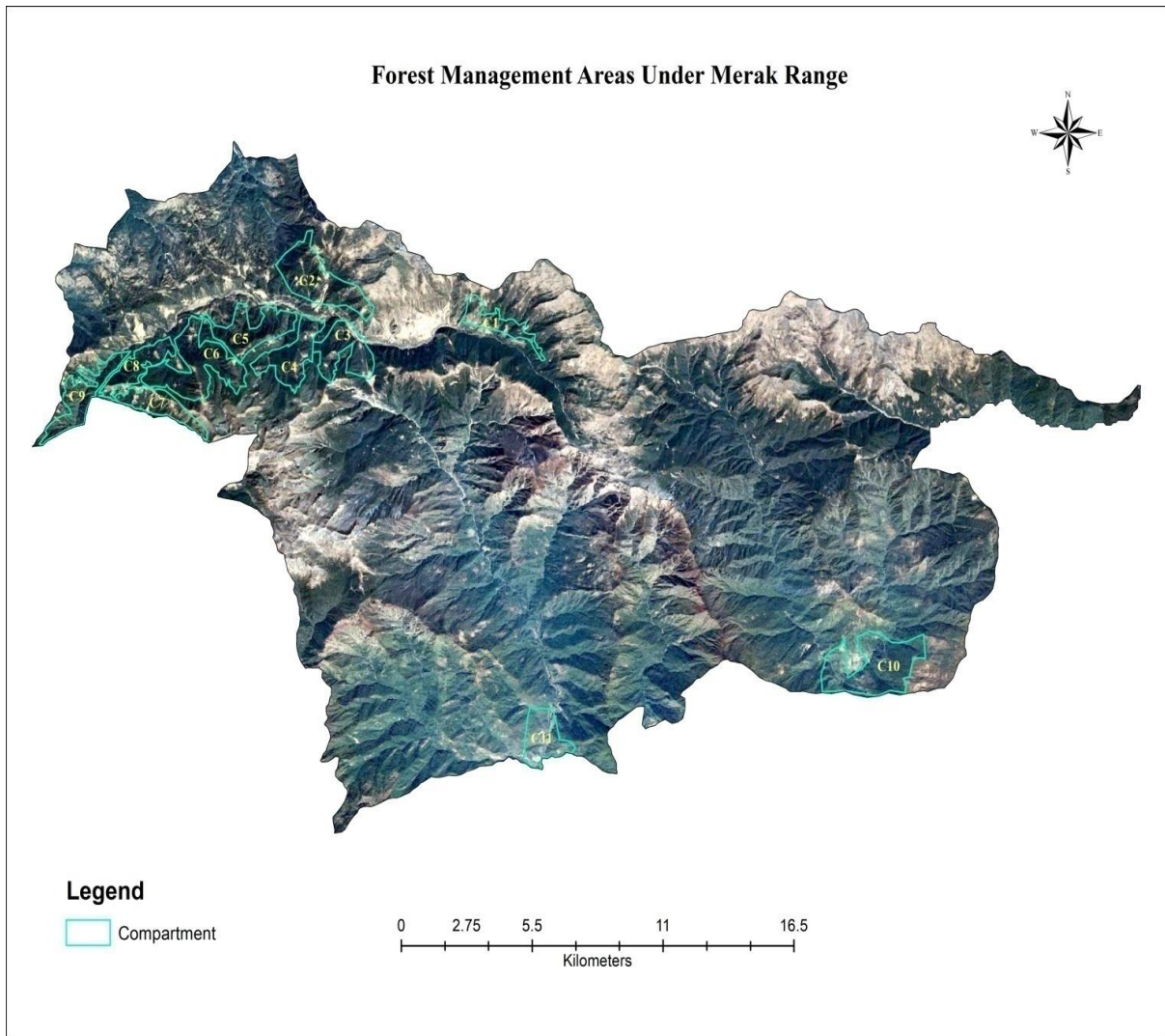
Sub-Compartment Record																																																																																																																																							
Geog	Sakteng	Comp.	5Melamthung-Barmatoe	Sub-Comp.	Tshoiteng	No.	b																																																																																																																																
Areas in ha																																																																																																																																							
Non Forest Area	1.0	Protection	7.7	In-operable	17.7	Production	71.0																																																																																																																																
Forest Composition and Description																																																																																																																																							
Hardwood forest with majority of matured stand and closed canopy cover.						Stand data																																																																																																																																	
						Bas. Area (m2/ha)	36.7																																																																																																																																
						Tot. Vol. (m3/ha)	580.0																																																																																																																																
						Vconifer %																																																																																																																																	
<p>Number of trees/ha by diameter class (dbh>10 cm)</p>						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td></td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td>100</td> <td>Firewood</td> <td></td> <td>100</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>25</td> <td>75</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <th>Canopy</th> <th>%</th> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td>40</td> <td>Daphne</td> <td>25</td> <td>75</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>60</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td></td> <th>Forest Use</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>75</td> <td>Grazing</td> <td>40</td> <td>60</td> </tr> <tr> <td>Immature</td> <td>25</td> <td>Average</td> <td>25</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>75</td> <td>Poor</td> <td></td> <td>Lopping</td> <td>25</td> <td>75</td> </tr> <tr> <td>Overmature</td> <td></td> <th>Site Characteristics</th> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>25</td> <td>Stable</td> <td>50</td> <td>High</td> <td colspan="2">75</td> </tr> <tr> <td>Moderate</td> <td>75</td> <td>Moderate</td> <td>50</td> <td>Moderate</td> <td colspan="2">25</td> </tr> <tr> <td>Steep</td> <td></td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2"></td> </tr> </tbody> </table>				Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation		Type	%	%	Fir		Natural	100	Firewood		100	Spruce		Coppice		Bamboo	25	75	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense	40	Daphne	25	75	Chir Pine		Closed	60				Hardwood	100	Open					Mixed H/C		Unstocked		Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	75	Grazing	40	60	Immature	25	Average	25	Shokshing			Mature	75	Poor		Lopping	25	75	Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	25	Stable	50	High	75		Moderate	75	Moderate	50	Moderate	25		Steep		Unstable		Low		
Forest Type	%	Stand Type	%	NWFP+firew.	A	S																																																																																																																																	
Hemlock		Plantation		Type	%	%																																																																																																																																	
Fir		Natural	100	Firewood		100																																																																																																																																	
Spruce		Coppice		Bamboo	25	75																																																																																																																																	
Mixed Conifer		Canopy	%	Cane																																																																																																																																			
Blue Pine		Dense	40	Daphne	25	75																																																																																																																																	
Chir Pine		Closed	60																																																																																																																																				
Hardwood	100	Open																																																																																																																																					
Mixed H/C		Unstocked		Forest Use	I	E																																																																																																																																	
Age Class	%	Condition	%	Type	%	%																																																																																																																																	
Young		Good	75	Grazing	40	60																																																																																																																																	
Immature	25	Average	25	Shokshing																																																																																																																																			
Mature	75	Poor		Lopping	25	75																																																																																																																																	
Overmature		Site Characteristics																																																																																																																																					
Slope	%	Erosiveness	%	Soil Cover	%																																																																																																																																		
Gentle	25	Stable	50	High	75																																																																																																																																		
Moderate	75	Moderate	50	Moderate	25																																																																																																																																		
Steep		Unstable		Low																																																																																																																																			
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																											
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																										
Beilschmiedia spp.																																																																																																																																							
Cinnamomum spp.		53	11	6		1	0					19	4																																																																																																																										
Exbucklandia																																																																																																																																							
Litsea spp.																																																																																																																																							
Michelia spp.																																																																																																																																							
Persea spp.	35	88	11	22	18	22	5	4	2	0		85	20																																																																																																																										
Quercus spp.	53	230	91	41	19	13	6	3	3	2	12	189	43																																																																																																																										
Schima spp.								0			12	13	3																																																																																																																										
Walnut																																																																																																																																							
Other Broadleave	212	619	28	49	27	13	7	4	2	1		131	30																																																																																																																										
Conifer spp.																																																																																																																																							
Total	301	990	141	118	63	48	19	11	7	4	24	437	100																																																																																																																										
Future Management & Monitoring of Activities																																																																																																																																							
Manag. Option	No activities	Felling recommended for timber and firewood.																																																																																																																																					
	Improvement																																																																																																																																						
	Timber Use																																																																																																																																						
	Firewood Use																																																																																																																																						
	Silvopasture																																																																																																																																						
	Sokshing																																																																																																																																						
Production Potential (N, Volume)					No of trees removed each year										Total	%																																																																																																																							
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
>50	Drashing	810	11	81	2422																																																																																																																																		
	Firewood	2944	41		18315																																																																																																																																		
30-49	Cham	2313	33	93	2609																																																																																																																																		
	Firewood	5032	71		4944																																																																																																																																		
20-29	Tsim	434	6	83	135																																																																																																																																		
	Firewood	6505	92		1983																																																																																																																																		
10-19	Poles, etc.			60																																																																																																																																			
	Firewood	6023	85		488																																																																																																																																		
Silvicultural Measures					Area in ha implemented per year										Total	%																																																																																																																							
Measure	Area (ha)	in %			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																									
Planting																																																																																																																																							
Thinning																																																																																																																																							
Felling	71.0	100%																																																																																																																																					
Assessment carried out by		SWS										Year:	2019																																																																																																																										

Sub-Compartment Record																	
Geog	Sakteng	Comp.	5Moelamthung-Barmatoe	Sub-Comp.	Pokshing	No.	c										
Areas in ha																	
Non Forest Area	3.9	Protection	3.0	In-operable	56.8	Production	26.7										
Forest Composition and Description																	
Dominated by hardwood and has open canopy. The soil cover and slope for most of the plots were moderate.						Stand data											
						Bas. Area (m2/ha)		10.5									
						Tot. Vol. (m3/ha)		67.6									
Vconifer %		2%															
<p style="text-align: center;">Number of trees/ha by diameter class (dbh>10 cm)</p>						Forest Type	%	Stand Type	%	NWFP+firew.	A	S					
						Hemlock		Plantation		Type	%	%					
						Fir		Natural	100	Firewood		100					
						Spruce		Coppice		Bamboo	50	25					
						Mixed Conifer		Canopy	%	Cane							
						Blue Pine		Dense		Daphne		75					
						Chir Pine		Closed	38								
						Hardwood	75	Open	63								
						Mixed H/C	25	Unstocked		Forest Use	I	E					
						Age Class	%	Condition	%	Type	%	%					
						Young		Good		Grazing	25	63					
						Immature	100	Average	100	Shokshing							
						Mature		Poor		Lopping		88					
						Overmature		Site Characteristics									
						Slope	%	Erosiveness	%	Soil Cover	%						
Gentle		Stable		High													
Moderate	50	Moderate	75	Moderate		100											
Steep	50	Unstable	25	Low													
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)					
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%				
Beilschmiedia spp.																	
Cinnamomum spp.					3							3	1				
Exbucklandia																	
Litsea spp.																	
Michelia spp.			14	5								19	7				
Persea spp.			42	5	13	3	1					65	24				
Quercus spp.				5		5	2					12	4				
Schima spp.																	
Walnut																	
Other Broadleave	840	1105	141	15	16	2						174	63				
Conifer spp.					3							3	1				
Total	840	1105	198	31	34	9	3					275	100				
Future Management & Monitoring of Activities																	
Manag. Option	No activities	<input checked="" type="checkbox"/>															
	Improvement	<input type="checkbox"/>															
	Timber Use	<input type="checkbox"/>															
	Firewood Use	<input type="checkbox"/>															
	Silvopasture	<input type="checkbox"/>															
	Sokshing	<input type="checkbox"/>															
Production Potential (N, Volume)				No of trees removed each year												Total	%
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028			
> 50	Drashing	28	1	67	68												
	Firewood	28	1		68												
30-49	Cham	250	9	57	225												
	Firewood	404	15		370												
20-29	Tsim	272	10	100	83												
	Firewood	544	20		161												
10-19	Poles, etc.	3024	113	79	209												
	Firewood	1134	42		77												
Silvicultural Measures				Area in ha implemented per year												Total	%
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
Planting																	
Thinning																	
Felling																	
Assessment carried out by			SWS										Year:	2019			

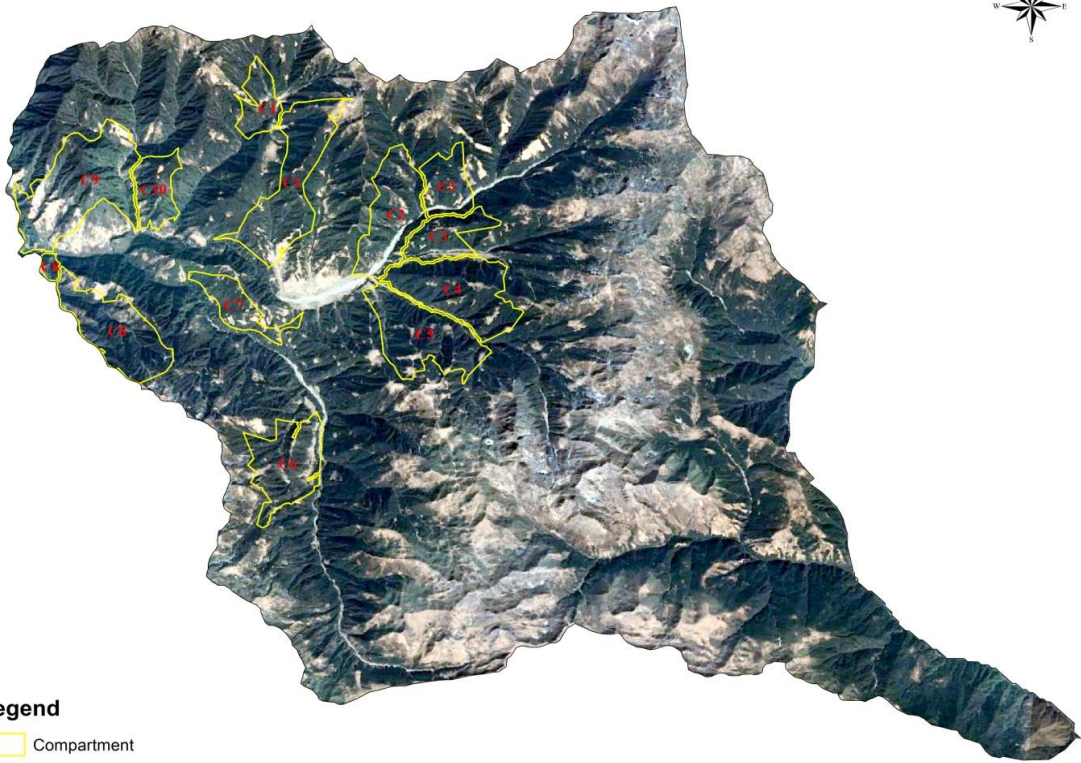
Sub-Compartment Record																																																																																																																																								
Geog	Sakteng	Comp.	5Melamthung-barmatoc	Sub-Comp.	Barma	No.	d																																																																																																																																	
Areas in ha																																																																																																																																								
Non Forest Area	8.9	Protection	1.8	In-operable	21.8	Production	68.9																																																																																																																																	
Forest Composition and Description																																																																																																																																								
Hardwood forest with open canopy. Stands were matured and average in condition.						Stand data																																																																																																																																		
						Bas. Area (m2/ha)	13.9																																																																																																																																	
						Tot. Vol. (m3/ha)	373.7																																																																																																																																	
						Vconifer %																																																																																																																																		
						<table border="1"> <thead> <tr> <th>Forest Type</th> <th>%</th> <th>Stand Type</th> <th>%</th> <th>NWFP+firew.</th> <th>A</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>Hemlock</td> <td></td> <td>Plantation</td> <td>100</td> <td>Type</td> <td>%</td> <td>%</td> </tr> <tr> <td>Fir</td> <td></td> <td>Natural</td> <td></td> <td>Firewood</td> <td></td> <td>84</td> </tr> <tr> <td>Spruce</td> <td></td> <td>Coppice</td> <td></td> <td>Bamboo</td> <td>21</td> <td>42</td> </tr> <tr> <td>Mixed Conifer</td> <td></td> <td>Canopy</td> <td>%</td> <td>Cane</td> <td></td> <td></td> </tr> <tr> <td>Blue Pine</td> <td></td> <td>Dense</td> <td></td> <td>Daphne</td> <td>11</td> <td>63</td> </tr> <tr> <td>Chir Pine</td> <td></td> <td>Closed</td> <td>32</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hardwood</td> <td>100</td> <td>Open</td> <td>42</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mixed H/C</td> <td></td> <td>Unstocked</td> <td>26</td> <th>Forest Use</th> <th>I</th> <th>E</th> </tr> <tr> <th>Age Class</th> <th>%</th> <th>Condition</th> <th>%</th> <th>Type</th> <th>%</th> <th>%</th> </tr> <tr> <td>Young</td> <td></td> <td>Good</td> <td>37</td> <td>Grazing</td> <td>32</td> <td>68</td> </tr> <tr> <td>Immature</td> <td>5</td> <td>Average</td> <td>53</td> <td>Shokshing</td> <td></td> <td></td> </tr> <tr> <td>Mature</td> <td>95</td> <td>Poor</td> <td>11</td> <td>Lopping</td> <td>5.3</td> <td>89</td> </tr> <tr> <td>Overmature</td> <td></td> <th colspan="2">Site Characteristics</th> <td></td> <td></td> <td></td> </tr> <tr> <th>Slope</th> <th>%</th> <th>Erosiveness</th> <th>%</th> <th>Soil Cover</th> <th colspan="2">%</th> </tr> <tr> <td>Gentle</td> <td>5</td> <td>Stable</td> <td>47</td> <td>High</td> <td colspan="2">58</td> </tr> <tr> <td>Moderate</td> <td>37</td> <td>Moderate</td> <td>53</td> <td>Moderate</td> <td colspan="2">42</td> </tr> <tr> <td>Steep</td> <td>58</td> <td>Unstable</td> <td></td> <td>Low</td> <td colspan="2"></td> </tr> </tbody> </table>					Forest Type	%	Stand Type	%	NWFP+firew.	A	S	Hemlock		Plantation	100	Type	%	%	Fir		Natural		Firewood		84	Spruce		Coppice		Bamboo	21	42	Mixed Conifer		Canopy	%	Cane			Blue Pine		Dense		Daphne	11	63	Chir Pine		Closed	32				Hardwood	100	Open	42				Mixed H/C		Unstocked	26	Forest Use	I	E	Age Class	%	Condition	%	Type	%	%	Young		Good	37	Grazing	32	68	Immature	5	Average	53	Shokshing			Mature	95	Poor	11	Lopping	5.3	89	Overmature		Site Characteristics					Slope	%	Erosiveness	%	Soil Cover	%		Gentle	5	Stable	47	High	58		Moderate	37	Moderate	53	Moderate	42		Steep	58	Unstable		Low		
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Steep	58	Unstable		Low																																																																																																																																				
Species	Height 0.3<1.3 m	N/ha per diameter class										Total (> 10cm)																																																																																																																												
		<10	10<20	20<30	30<40	40<50	50<60	60<70	70<80	80<90	90+	N/ha	%																																																																																																																											
Beilschmiedia spp.																																																																																																																																								
Cinnamomum spp.					2							2	1																																																																																																																											
Exbucklandia																																																																																																																																								
Litsea spp.																																																																																																																																								
Michelia spp.				2		1						3	1																																																																																																																											
Persea spp.	56	93		4	10	12	2	1	1			30	12																																																																																																																											
Quercus spp.	74	112			3	3	3	2	3	1	18	33	13																																																																																																																											
Schima spp.																																																																																																																																								
Walnut			12									12	5																																																																																																																											
Other Broadleaved	391	372	131	26	2	2		0	0		3	164	67																																																																																																																											
Conifer spp.																																																																																																																																								
Total	521	577	143	32	18	18	5	3	4	1	21	244	100																																																																																																																											
Future Management & Monitoring of Activities																																																																																																																																								
Manag. Option	No activities		Plantation recommended.																																																																																																																																					
	Improvement	√																																																																																																																																						
	Timber Use																																																																																																																																							
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	Silvopasture																																																																																																																																							
	Sokshing																																																																																																																																							
Production Potential (N, Volume)					No of trees removed each year										Total	%																																																																																																																								
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028																																																																																																																										
> 50	Drashing	192	3	63	646																																																																																																																																			
	Firewood	1253	18		12132																																																																																																																																			
30-49	Cham	984	14	88	1037																																																																																																																																			
	Firewood	1167	17		1246																																																																																																																																			
20-29	Tsim	443	6	33	126																																																																																																																																			
	Firewood	296	4		80																																																																																																																																			
10-19	Poles, etc.	1232	18	25	87																																																																																																																																			
	Firewood	1232	18		87																																																																																																																																			
Silvicultural Measures					Area in ha implemented per year										Total	%																																																																																																																								
Measure	Area (ha)	in %																																																																																																																																						
Planting	7.3	11%																																																																																																																																						
Thinning																																																																																																																																								
Felling																																																																																																																																								
Assessment carried out by		SWS										Year:	2019																																																																																																																											

Sub-Compartment Record																
Geog	Sakteng	Comp.	5Moelamthung-Barmatoc	Sub-Comp.	Barmatoc	No.	e									
Areas in ha																
Non Forest Area		Protection	4.9	In-operable	32.7	Production	58.0									
Forest Composition and Description																
Hardwood forest with matured stand. NWPf like firewood and daphne were sparse. Grazing and lopping were extensive.						Stand data										
						Bas. Area (m2/ha)	34.1									
						Tot. Vol. (m3/ha)	271.0									
						Vconifer %										
						Forest Type	%	Stand Type	%	NWFP+firew.	A	S				
						Hemlock		Plantation		Type	%	%				
						Fir		Natural	100	Firewood	19	81				
						Spruce		Coppice		Bamboo	19	81				
						Mixed Conifer		Canopy	%	Cane						
						Blue Pine		Dense	25	Daphne	31	69				
						Chir Pine		Closed	44							
						Hardwood	100	Open	31							
						Mixed H/C		Unstocked		Forest Use	I	E				
						Age Class	%	Condition	%	Type	%	%				
						Young		Good	56	Grazing	44	56				
						Immature		Average	44	Shokshing						
						Mature	100	Poor		Lopping	31	69				
						Overmature		Site Characteristics								
						Slope	%	Erosiveness	%	Soil Cover	%					
Gentle	50	Stable	25	High	38											
Moderate	50	Moderate	75	Moderate	56											
Steep		Unstable		Low												
Future Management & Monitoring of Activities																
Manag. Option	No activities	Felling and thinning recommended for firewood and timber.														
	Improvement															
	Timber Use	√														
	Firewood Use	√														
	Silvopasture															
	Sokshing															
Production Potential (N, Volume)				No of trees removed each year												
Product size	N total	N/ha	%	(m3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%
> 50	Drashing		100													
	Firewood	1908		33	6286											
30-49	Cham	756	13	747												
	Firewood	5024	87	5021												
20-29	Tsim		75													
	Firewood	7539		130	2262											
10-19	Poles, etc.															
	Firewood															
Silvicultural Measures				Area in ha implemented per year												
Measure	Area (ha)	in %		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total	%	
Planting																
Thinning	21.8	38%														
Felling	36.3	63%														
Assessment carried out by		SWS										Year:	2019			

Annexure 18 : Google map of Forest management areas

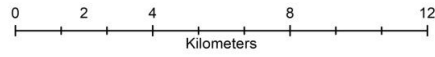


Forest Management Areas Under Sakteng Range



Legend

 Compartment

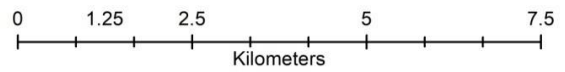


Forest Management Areas under Joenkhar Range



Legend

 Compartment





Sakteng Wildlife Sanctuary
Department of Forests & Park Services
Ministry of Agriculture and Forests
Royal Government of Bhutan

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