Rangeland Management Plan 2018-22 (Byas rural municipality ward no.1

Pemba Sherpa, ACO

API NAMPA CONSERVATION AREA OFFICE Darchula

ABBREVIATIONS/ACRONYMS

ACA: Annapurna Conservation Area

ANCA: Api Nampa Conservation Area

CAs: Conservation Areas

DNPWC: Department of National Parks and Wildlife Conservation

FGD: Focus Group Discussion

HDI: Human Development Index

GoN: Government of Nepal

HRD: Human Resources Development

HWC: Human Wildlife Conflict

ICDP: Integrated Conservation and Development Program

ICIMOD: International Centre for Integrated Mountain Development

IUCN: International Union for Conservation of Nature

KSL: Kailash Scared Landscape

MoFSC: Ministry of Forests and Soil Conservation

NGO: Non-Governmental Organization

NPR: Nepalese Rupee

NRM: Natural Resources Management

NTNC: National Trust for Nature Conservation

PAs: Protected Areas

PAF: Poverty Alleviation Fund

PNRMP: Participatory Natural Resources Management Plan

TNA: Training Need Assessment

UNDP: United Nation Development Programme

UNESCO: United Nations Educational, Scientific and Cultural Organization

WWF: World Wildlife Fund

CONTENTS

INTRODUCTION

The Himalayan region, 'the greatest physical feature and the magnificent monument of the earth', covers approximately 23% of Nepal along its northern border with Tibet an Autonomous region of China (LRMP). Being the world's highest mountain chain, the Himalayas is characterized by its great height, complex geologic, large valley glaciers, deep river gorges, harsh climatic and extremely high fragility of the environment often with low precipitation, a short growing season, low primary productivity, and high stocking density (ICIMOD, 2000). This has in turn led to profound influences on the climate, environment and population distribution on the Earth. The Himalayan region also resembles a unique geographical and geological entity comprising a diverse social, cultural, agro-economic and environmental set-up that provide a mosaic of vegetation communities along their altitudinal gradient. This, together with a myriad of topographical features, places the mountains at a comparative ecological advantage over the plains by providing habitats for a unique assemblage of large ungulates together with the Himalayan rangelands (Schaller, 1977).

The rangeland ecosystem in the Hindu-Kush Himalayan (HKH) region, encompass about 2 million sq. km territory in which Nepal itself covers approximately 20,000 sq. km (ICIMOD, 2000). Situated at the confluence of five major biogeographical sub-regions - the Mediterranean and Siberian of the Palaearctic realm and the West Chinese, Indochinese, and Indian sub-regions of the Oriental realm - the rangeland ecosystems of the Himalayas and Tibetan Plateau are rich in faunal Biodiversity (Schaller, 1977). In terms of ungulates, or large, hoofed grazing mammals, the rangelands of the Himalayas and Tibetan Plateau provide habitat for 42 species and subspecies (Fox, 1997; Miller, 1993). Of special Biodiversity significance in these rangelands are the Caprinae (wild sheep and goats). It also represents part of the original center of Caprinae evolution, and as such, encompasses both a high diversity of taxa and a wide array of forms from primitive to advanced (Shackleton 1997; Schaller 1977). Therefore, no other ecosystem dominates the region as rangelands do (Miller, 2000).

In this extremely harsh environments, nomad still thrive practicing a unique form of nomadic pastoralism that is distinct from pastoralism in most other semi-arid regions for thousands of years (Miller, 1996). The nomadism in this region is vertical transhumance often characterized by summer and winter high mountain ranges they

have successfully built a vibrant culture and a unique way of survival in this hostile natural environment for thousands of years (Tsundue, 1999). Despite their extent and important, rangeland ecosystem dynamics in the Himalayan region are still poorly understood (Miller, 1996). Scientific data on ecological processes taking place throughout different rangeland types are limited, and the socio-economic dimensions of the pastoral production systems are not well known. This lack of information limits the proper management and sustainable development of rangelands.

POLICIES RELATED TO RANGELAND MANAGEMENT IN NEPAL

Government of Nepal has forth brought Rangeland Policy, 2010 with a vision of improving the livelihood of the rangeland dependent communities and thereby contributing to the national economy. The major objectives of the national rangeland policy are to upgrade the status of the rangelands and thereby increasing its productivity, develop and promote the rangeland based enterprises and conserve, promote and utilize rangeland biodiversity in a sustainable and scientific manner thereby contributing in balancing the rangeland ecosystem.

For effective implementation of the policy provisions following institutional coordinating mechanism has been formed. At the central level, National Planning Commission member looking after agriculture and forestry portfolio will chair the national level coordination committee. Similarly Director General of Department of Livestock Services will chair the departmental level management committee. Likewise, the Local Development Officer, District Development Committees will chair the district level implementation coordination committee in the respective districts. The national level guidance committee and management committee will assure the responsibility of formulating and revision of the necessary guidelines, directives needed for the effective implementation of the policy.

Main policies and plans related to Rangeland management:

- National Rangeland Policy, 2010
- Agriculture Perspective Plan (APP), 1995-2015

- National Agriculture Policy (NAP), 2004
- Agro-Business Promotion Policy (ABPP), 2006
- Approach Paper to the 13th Plan (2013/14-2015/16) and
- Agriculture/Livestock Development Policies

Similarly other secondary policies related to livestock and rangeland management are:

- Animal Feed Act, 1976
- Animal Health and Livestock Services Act, 1999 and Animal Health Program Implementation Procedure, 2013
- Forestry Sector Policy, 2000
- National Micro-Finance Policy, 2005
- Dairy Development Policy, 2007
- Climate Change Policy, 2011
- Breeding Policy, 2011
- Livestock Insurance Policy and Agriculture and Livestock Insurance Regulation
- National Land Use Policy, 2012

METHODOLOGY USED FOR PLAN PREPARATION

National Rangeland Policy 2010, Forest Sector Policy, 2000, National Park and Wildlife Conservation Act, 1973, National Park and Wildlife Conservation Regulation, 1975, Conservation Area Government Management Regulation, 2000, National Biodiversity Strategy and Implementation Plan (2014-2020) has played crucial role in drafting this plan.

Primary Data Collections:

- Key Informant Survey (KIS), Household Survey (HHS) and Focus Group Discussions (FGDs) with the target user groups were done during the field visit in the study area. Loads of information regarding livestock management and development, rangeland use and management, Preference ranking of the major pastures and sub-pastures, mapping and modeling of the vegetation types and the pastures, seasonal and historical diagramming of the pastures and and traditional use rights with rangeland participatory mapping were done.,

The specialized multi-scale sampling techniques, smaller minimum mapping units (based on landscape scale vegetation patterns), and an unbiased sampling design based on double sampling, improved mathematical models such as species-area curves corrected for habitat heterogeneity, and geographic information system-GIS were applied. Quadrate sampling on transects (fixed using GPS) along the vegetation gradients within a selected micro and macro scale landscape will be applied at an interval of 50m as employed. Quadrate size of 2m by 2m for the shrub community and 1m by 1m for other vegetation type mostly (herbaceous) grass species was applied. Unidentified plant species were collected and sent to National Herbarium Center in Kathmandu for taxonomic identification.

Pasture characterization was carried out to address three scales of assessment: the pasture unit, the plant community transect, and the vegetation plot. Herder interviews and pasture mapping exercises were used to validate the importance of using selected pasture units to designate land-management areas by using a common spatial entity for resource management and planning initiatives, namely the major pasture boundaries. In order to assist this mapping process, the FGDs were done and pasture tenure documented.

1. ***Pasture unit characterization:*** One pasture unit equals the main customary boundary of particular users' group, i.e. some "units" may overlap. Each unit of pastures generally has many sub-pastures based on various indigenous ecological knowledge (IEK) and topographic features (altitude, slope, aspects etc.) within its boundary. This was done on the basis of following quantitative and qualitative parameters.

- Pasture name and boundaries (geo-referenced and mapped on 1:50,000 topographic maps and Aerial photography taken in 1978) verified through focus group discussion (FGD)/local interviews.
- Sub-pasture names and relative percentage of each within the total pasture unit (grazing suitability index- GSI and potential grazing capacity index-PGCI using ranking criteria for relative importance).
- GPS readings for all camps of herding pattern in any given year and season of use.
- Types of plant communities' observed and relative percentage of each type (with estimates of boundaries within each pasture unit mapped on the topographic map).
- Types and numbers of livestock.
- Names of users, their village(s) and Village Development Committee (VDC)-the smallest political units.
- Locals access rights and regulations.
- Livestock mobility patterns within each pasture unit (both daily and seasonal herding patterns).
- Types of wildlife noted through local interview, relative abundance and trends in populations.
- Medicinal plant use and abundance, and harvesting practices.
- Local herder knowledge for determining rangeland/forage.
    - preferred forage plants
    - Indicators of grazing intensity
    - Indicators of range health
    - Preferred vegetation composition

2. ***Plant community transects***. Each transect of 100 m in length was used and randomly placed within a relatively homogenous patch of a "representative" vegetation community type (e.g. *Kobresia pygmaea* of dry meadow). All transects was placed to follow the contour or river streams as much as possible. This was based on the following quantitative and qualitative parameters:

- Pasture unit name (using a map unit code for the MIS).
- GPS reading at beginning of transect.
- Compass bearing along transect from beginning to end.
- Elevations at beginning of transect (read from GPS).
- Dominant aspect of hillslope.
- Dominate slope steepness (in degrees).
- Bedrock type
- Soil type/surface color (indicate dry or wet)
- Landform (river bed/gully, valley bottom, toe slope, side slope, ridge).
- Terrain (level to gently rolling, medium to steeply rolling, broken to very broken, cliff).
- Distance to (camp, other vegetation types, water, broken terrain/cliff).
- Degree of shrub browsing (little, moderate, severe).
- Types of vegetation stresses noted (heat & cold, salt, drought, fertility, grazing, water logging, etc.)
- Signs of disturbance and degree (yak wallows, marmots or pika burrows, trails, erosion, human uses such as dung collection, fuelwood collection, fire, etc).

3. ***Vegetation Plot.*** The vegetation plot of 1.0 x 1.0 m for grassland (herbaceous) communities and 2.0 x 2.0 m for shrub communities were used. Five plots were

incrementally spread along each transect, e.g. every 20 m for the 100 m transect. The distance of transects from one other will be maintained at 50 m.

DATA ANALYSIS (VEGETATION ANALYSIS)

THE FOLLOWING PARAMETERS WERE ANALYZED AFTER THE SAMPLINGS OF THE VEGETATION TAKEN.

Biomes

Species and functional group cover

Measurement of Importance Value Index (IVI) and Prominence Value (PV)

Species Richness Value (SRV)

Index of Similarity (IS)

API NAMPA CONSERVATION AREA

Api Nampa Conservation Area (Long. 80°22'-84°09' and Lat. 29°30'-30°15'), the youngest conservation area, lies in the far west region and is the young and furthest northern west conservation area situated in remote area of Darchula district of Nepal and is a part of Kailash Sacred Landscape (KSL) in the border of China, Nepal and India. It encompasses five recently formed rural municipalities and part of one municipality of Darchula district covering 1903 sq.km.(more than 80% of the whole Darchula district), bordering to the Tibetan Autonomous Region (TAR) of China in north and India in the west, Baitadi and Bajhang districts of Nepal in the south and west respectively. ANCA borrowed its name from Api (7,132 m) and Nampa (6,757 m) peaks. The conservation area lies above 1000 m resembling sub-tropical to alpine climatic region.

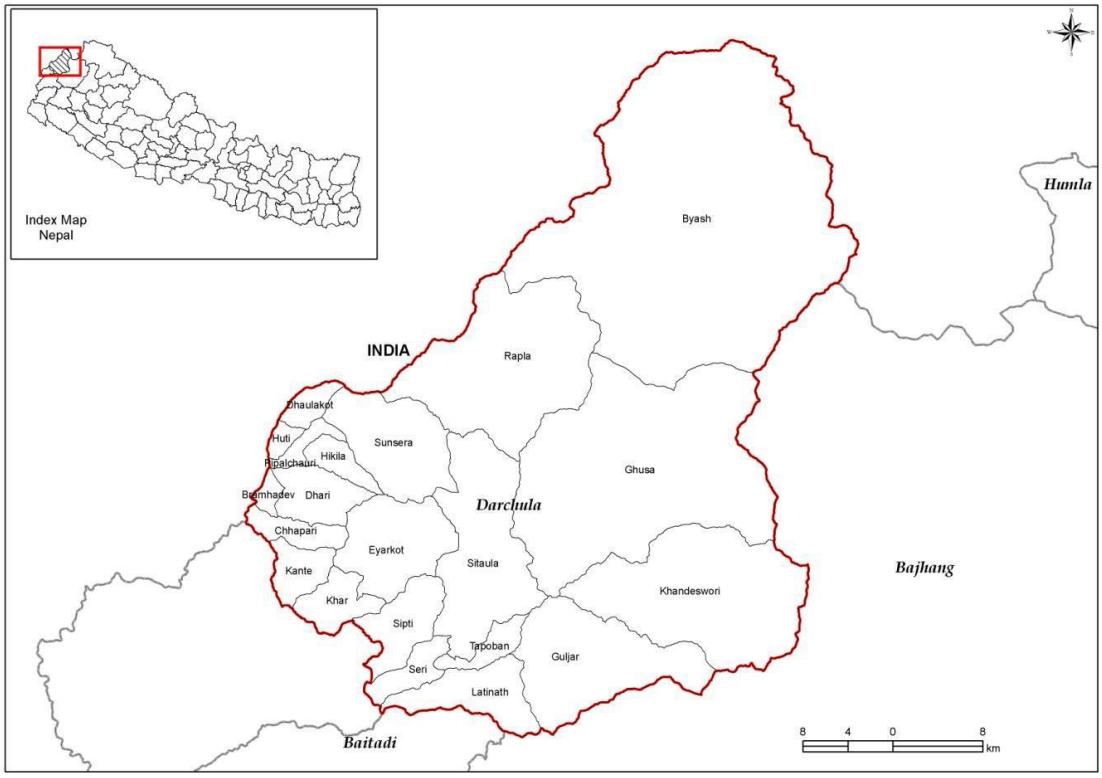


FIGURE 1: LOCATION MAP OF ANCA (SOUCE: ANCA, 2008)

ANCA is endowed with floral and faunal diversity and is rich in unique cultural diversity and a sacred site. Rare and endangered species such as Snow Leopard, Himalayan Black Bear and Musk Deer are found in this protected area. ANCA

represents WWF's 200 globally important eco-regions: Western Himalayan Temperate Forest (1,500-2,600 msl). In addition, ANCA is a home to high value NTFPs/MAPs such as Yarsagumba (*Cordyceps sinensis*), Jatamansi (*Nardostachys jatamansi*), Sugandhawal (*Valeriana wallichaii*), Lauth Salla (*Taxus bacatta*) and Bojho (*Acorus calamus*).

NATURAL RESOURCES

FOREST ECOSYSTEMS

ANCA lies within Himalayan Biodiversity Hotspots due to its diverse array of eco-regions, ecosystem, and biomes where many endangered and endemic species of flora and fauna are inhabited (Conservation International, 2005). Among 200 globally important eco-regions, ANCA represents Western Himalayan temperate Forest, which occurs between 1500-2600m and comprises of verities of oak species (*Quercus semecarpifolia*, *Q. dilatata*, *Q. lamellosa* and *Q. incana)*, *Pinus, Abies*, *Picea*, and deodar (*Cedrusdeodara*) species at higher altitude. Major eco-regions which represent unique habitat types in ANCA are listed as follows:

Himalayan subtropical broadleaf forest (500m to 1000 m)

Sal (*Shorea robusta*) occurs in the lower altitude while early-successional species such as *Alnus* species occur along the landslide areas and forms mono-specific stands along with *Albizia* species (Zomer and Oli, 2011).

Himalayan subtropical pine forest: (1000-2000m.)

The major forest type found in this eco-region is *Pinus roxburghii*.

Western Himalayan temperate/broadleaf forest: This eco-region is one of the 200 globally important eco-regions which lie between 1500-2600m altitudes. The species of Oak (*Quercus semecarpifolia*, *Q. dilatata*, *Q. lamellosa* and *Q. incana are)* dominant on the moister southern slopes whereas *Quercus* and *Ilex* species are dominant on the north-facing slopes and along the higher elevations, sometimes mixed with conifers such as *Pinus, Abies*, *Picea*, and *Cedrus* species.

Western Himalayan subalpine conifer forest: Western Himalayan subalpine conifer forest extends from 3,000 to 3,500 m where extensive conifer forest with species such

as blue pine, silver fir, Himalyan fir, spruce mixed with oaks are more dominant. Moreover, this eco-region is also very rich in economically valuable NTFPs.

Western Himalayan alpine shrub and meadows:

This eco-region extends between 3,000 m and 5,000m altitudes where alpine scrub flora such as dwarf *Rhododendron* species is dominant along with shrubby species *Hippophae tibetana*, *Cotoneaster microphyllus*, and *Juniperus* species whereas herbaceous species such as *Anaphelis* spp., *Aster* spp., *Cyananthus* spp., *Jurinia* spp., *Morina* spp. and *Potentilla* etc. are dominant in alpine meadow.

A total of eight vegetation classes have been identified in ANCA (ICIMOD, 2013) with more than 500 species of flowering plants (ANCA records, 2014). Among them, alpine meadows occupied the largest area (32%), followed by the temperate broadleaved forest (20%), sub-alpine conifer forest (17%), alpine/primary scrubland (9%), sub-tropical broadleaved forest (9%), hill grassland (8%), and secondary scrubland (4%) respectively.

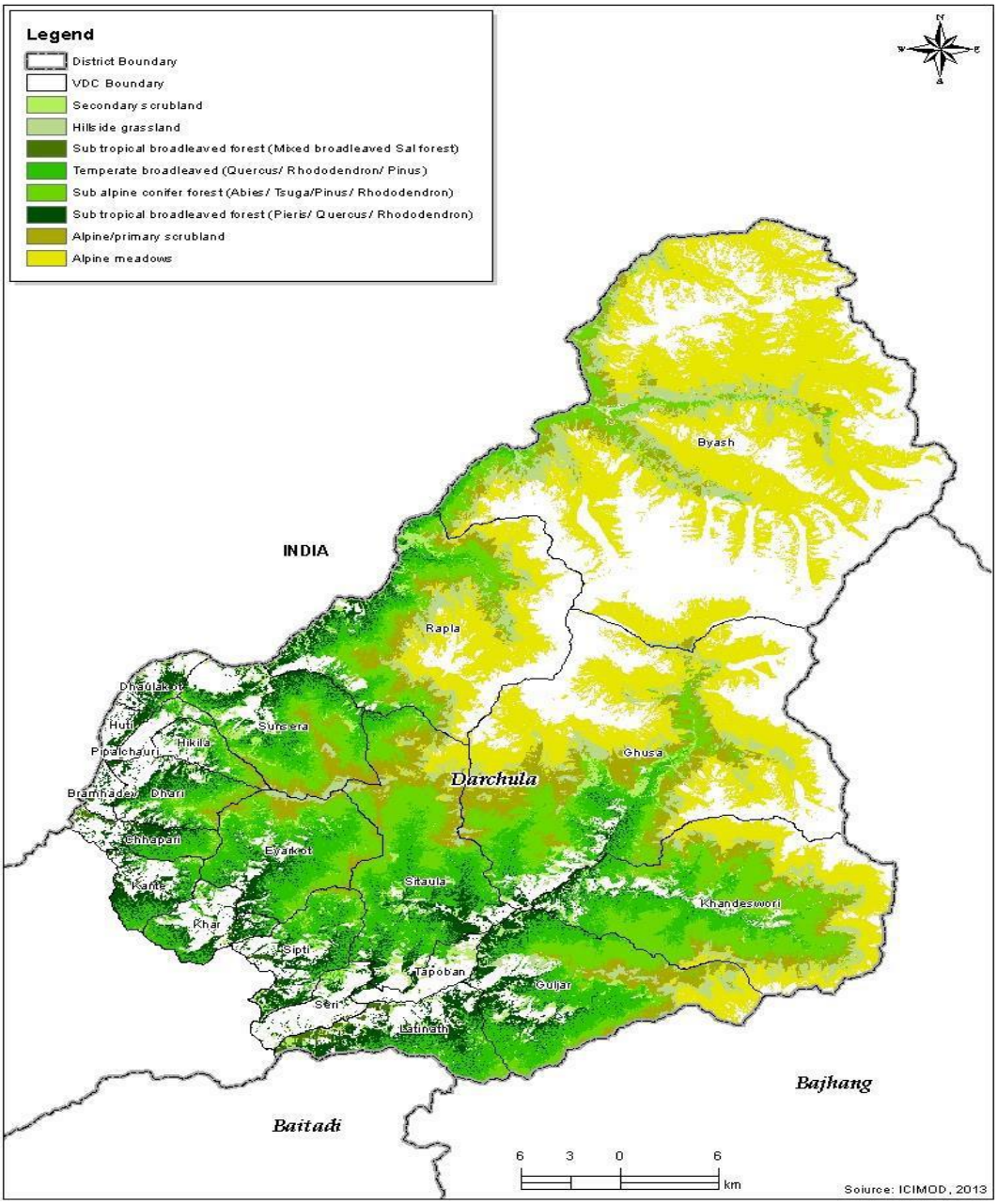


FIGURE 2: SPATIAL DISTRIBUTION OF VEGETATION TYPES (SOURCE: ICIMOD, 2013

FAUNAL DIVERSITY

ANCA is home to many globally and regionally threatened species of mammals and bird species such as snow leopard (*Panthera uncia*), musk deer (*Moschus moschiferous*) and cheer pheasants (*Catreus wallichii*). Earlier study reported ccurrence of Clouded leopard (*Neofelis nebulosa*) and Red panda (*Ailurus fulgens*), however,

study team did not confirm their presence. Other ecologically important mammalian species recorded in ANCA are Himalyan black bear (*Ursus thhibetanus)*, common leopard (*Panthera pardus*), Grey wolf (*Canis lupus*),jackal (*Canis aureus)*, barking deer (*Muntiacus muntkaj),* blue sheep (*Pseudois nayaur*), Rhesus (*Macaca mulata)*, Langur monkey (*Semnopithecus entellus)*, porcupine (*Hystrix indica)*, Himalayan thar (*Hemitragus jemlahicus*), Serow (*Capricornis sumatraensis*), Goral (*Nemorhaedus goral*) etc. The climate of ANCA varies greatly based on altitudinal gradient. Average annual minimum and maximum temperature in the region is recorded to be 13.69 ºC and 27.78 ºC respectively with the lowest monthly average minimum temperature recorded in December, January and February. The average annual precipitation was recorded to be 209.4 mm. with highest rainfall in the months of July and August and the least from November to April. (DHM, 2014). Regarding land cover, forest (33%) occupies the largest area followed by alpine meadow (22.96%), snow/glacier (19.73%), scrubland (9.38%), agriculture (8.48%), hillside grassland (5.80%), barren area (0.39%), water bodies (0.14%) and the least by built-up areas (0.04%).

Avian species

About 250 avian species are recorded in ANCA (ANCA Office, 2014). The common species found in the region are Danphe (*Lophophorus impejanus)*, Monal (*Tragopan satyra)*, Kalij (*Lophura leucomelanos*)different species of vulture species, eagles, jungle fowl (*Gallus gallus*) and different species of babblers, buntings and wabblers (**Zomer and Oli, 2011**).

Fish species

ANCA is also rich in fish diversity. The common species recorded in the region are, Asela (*Schisothorax spp.),* Mahseer *(Tor spp.), Garra and Labeo spp., Pseudoechinus spp., Glypothorax spp., Barilius spp. and Puntius spp. (***Zomer and Oli, 2011***)*.

POPULATION

The total population of 21 VDCs that lies in ANCA is about 59,609, of which the proportion of female (52%) is slightly more than the male (48%). The population density is consistent with the national trend where northern VDC (Byas) comprised of

sparse density while southern VDCs at lower altitude are densely populated (Guljar, Latinath, Sipti, Khar and Dhari VDC) (**NPC, 2011)**

ETHNIC GROUPS AND RELIGIONS

Out of the total population in ANCA, Chhetri (63.0%) occupy the highest proportion followed by Brahmin (17.32%), Dalit (11.85%), others (6.59%) and the indigenous group Byasi Sauka (1.25%-see box). Hinduism (98.2%) is the major religion followed by Buddhism (1.8%) (District Profile Darchula, 2008).

Box 1: Byasi Sauka

People living at the base of Byas Himalaya (6,670 msl) is called Byasi Sauka. It is believed that Saint Ved Byas used to meditate (*tapasya*) here. Byasi Sauka people are also known as *Rang*. Byasi Sauka has own dialect which is on the verge of extinction. They are very rich in terms of cultural heritages, traditional norms and local festivals. The traditional dress of women is called *Chyungwala* while that of men called *Ranga Be Thulbu*. They are Bon-po (Pre-Buddhist). *Gabla* is the major festival of Byasi Sauka. They have been living in Chharung and Tinker of Byas VDC, in addition to Shitola and Rapla VDC. During cold harsh season in winter, they migrate to Khalanga, district headquarters of Darchula and urban centers. They return to villages after winter. In recent years, Yarsagumba has become a major source of income. The population of *Byasi Sauka* is 2,103 (NPC, 2001). They are the known for

MAJOR OCCUPATION

Agriculture is the major occupation where nearly third (32.6%) population is involved. Likewise, livestock is the second major occupation with nearly 8 %. Agriculture is of subsistence type merely adequate for couple of months. The proportion of female engaged in agriculture and livestock is higher**.** It implies that women's contribution to agriculture and livestock is higher than men. The local community brings the leaf litter and fodders from community forests. In the upper regions, rotational grazing system still exists that uses winter and summer pasture depending on season. Besides agriculture and livestock rearing, majority of households now generate cash income by

collecting Yarsa Gumba in June –July (1.5-2 months). The entire family member engage in collecting yarsa and average income has been around NPR 250,000-400,000 (hh/season). Recently, there is a growing interest of NTFPs/MAPs in private and community land as village road is expanding. Similarly, there is long tradition of seasonal migration to India for wage labor.

CLIMATE

The climate of the ANCA is diverse due to variation in altitude and topography. Sub-tropical climate is more prevalent in south-eastern part and along the valleys of ANCA while temperate and alpine climate types are more dominant in the middle mountains and high Himalayas. In line with this, subtropical climate types found in southern part of Latinath, Tapoban, Sipti, Khar and Kante VDCs whereas temperate to alpine climate types occur in VDCs such as Byas, Rapla, Ghusa and Khandeswori situated at higher altitude (ANCA Mgt. plan, 2010-2014). Average annual minimum and maximum temperature in the region is recorded to be 13.69 ºC and 27.78 ºC respectively with the lowest monthly average minimum temperature recorded in December, January and February and highest monthly average maximum temperature recorded in May, June and July.

LAND COVER

Out of the total area of ANCA, forest (33%) occupies the largest area followed by alpine meadow (22.96%), snow/glacier (19.73%), scrubland (9.38%), agriculture (8.48%), hillside grassland (5.80%), barren area (0.39%), waterbodies (0.14%) and the least by built-up areas (0.04%).

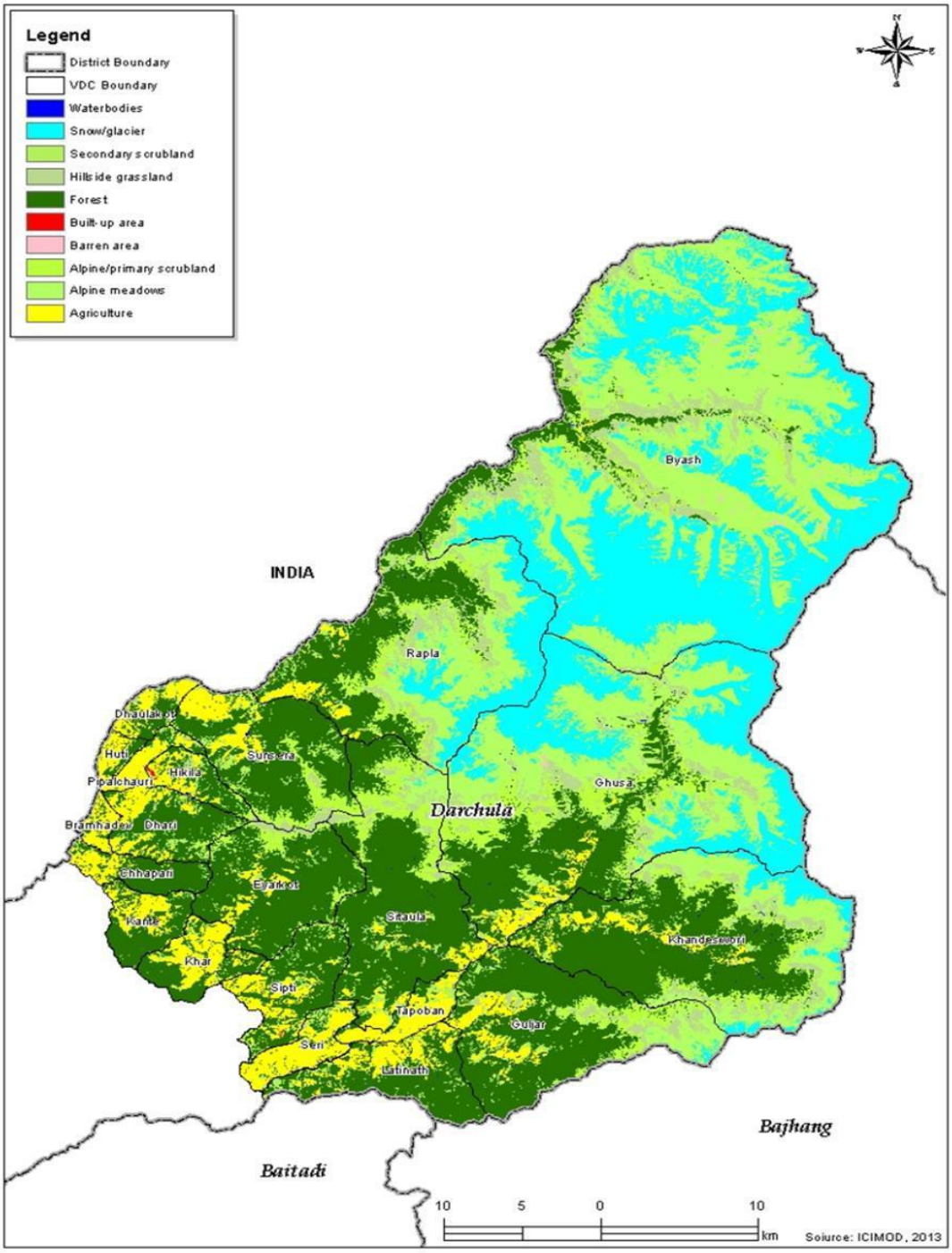


FIGURE 3: MAP SHOWING LANDUSE OF ANCA (SOURCE: ANCA, 2008)

CHHANGRU AND TINKAR VILLAGE (BYAS RURAL MUNICIPALITY WARD NO.1)

The Byas area and its forest is separated from Indian side by Mahakali River. The forest of Byas area is dominated by *Abies* and *Cupress* spp. There are about 149 households

in Chhangru and Tinker. The population of byas rural municipality is 556 (male-259 and female-297) with population density of 1.09 per sq.km. (District Profile, 2017). The Chhangru and Tinker village is 6 and 7 day walk respectively from Khalanga and borders with India and Tibet. Tinker is near is connected with Tibet through Taklakot entry point which once was a trade route to India, Nepal and Tibet. The temperature in Tinker reaches to -4 degree celcius in winter with heavy snowfall. In both Tinker and Chhangru people migrate to lower region around Kahalnga bazaar to escape the cold temperature and snow fall during September- March (Neupane T., 2016).

Settlement is fragmented where most of people rely on livestock, agriculture and seasonal NTFP trade for their livelihood (*Neupane T.*, 2016).

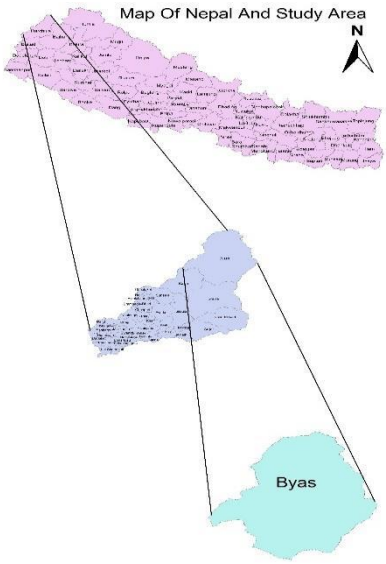


FIGURE 4: MAP OF BYAS RURAL MUNICIPALITY-1

The elevation of chhangru and tinkar village ranges from 2000m to above 6000 metre with few exception of below 2000 m altitudinal variation near mahakali border of India and Nepal (Dept. of Survey, GoN, 1994/98).

The majority of the area is rocks and barren land with few grassland and Snow and ice with nominal parts been occupied by shrubs and cultivated land (Dept. of Survey, GoN, 1994/98).

The forest resource comprises of mixed forest, grassland, shrub land and others (Dept. of Survey, GoN, 1994/98). Depending upon the microclimate, vegetation varies

from xeric to mesic. The vegetation comprises of temperate forest, subalpine to alpine forest. Rhododendron-Oak forest, Pinus wallichina forest, Oak-Laurel forest, Hemlock forest, Mountain Oak forest, Mixed broadleaf forest, Fir-Abies forest, Juglans regia forest, Betula forest, Juniper forest and Cotoneaster forest are the major vegetation profound in the area. High value MAPs such as Cordyceps, Allium wallichi, Paris polyphylla, Jatamansi, Valerian are major herbs collected in the area for trade and play crucial role in livelihood sustenance of the area. Different plant species including graminoids, forbs and shrubs thrive in the rangeland of the area in Dry grassland, Lonicera Community, Wet Meadow, Dry Meadow and Desert Steppes (Raut, 2001). The vegetation cover in the rangeland is generally sparse and rarely exceeds a height of 1 m. Naur (*Pseudois nayar*), Himalayan thar, Hare, and Snow leopard (*Uncia uncia*) are major mammals found in the area.

RANGELAND

Rangelands are vast natural landscapes in the form of grasslands, shrublands, woodlands, wetlands and deserts. Types of rangelands include tallgrass and shortgrass prairies, desert grasslands and shrublands, woodlands, savannas, chaparrals, steppes and tundras. It is perhaps easier to define rangelands by clearly describing what they are not. Rangelands are not: barren desert, farmland, closed canopy forests, or land covered by solid rock, concrete and/or glaciers.

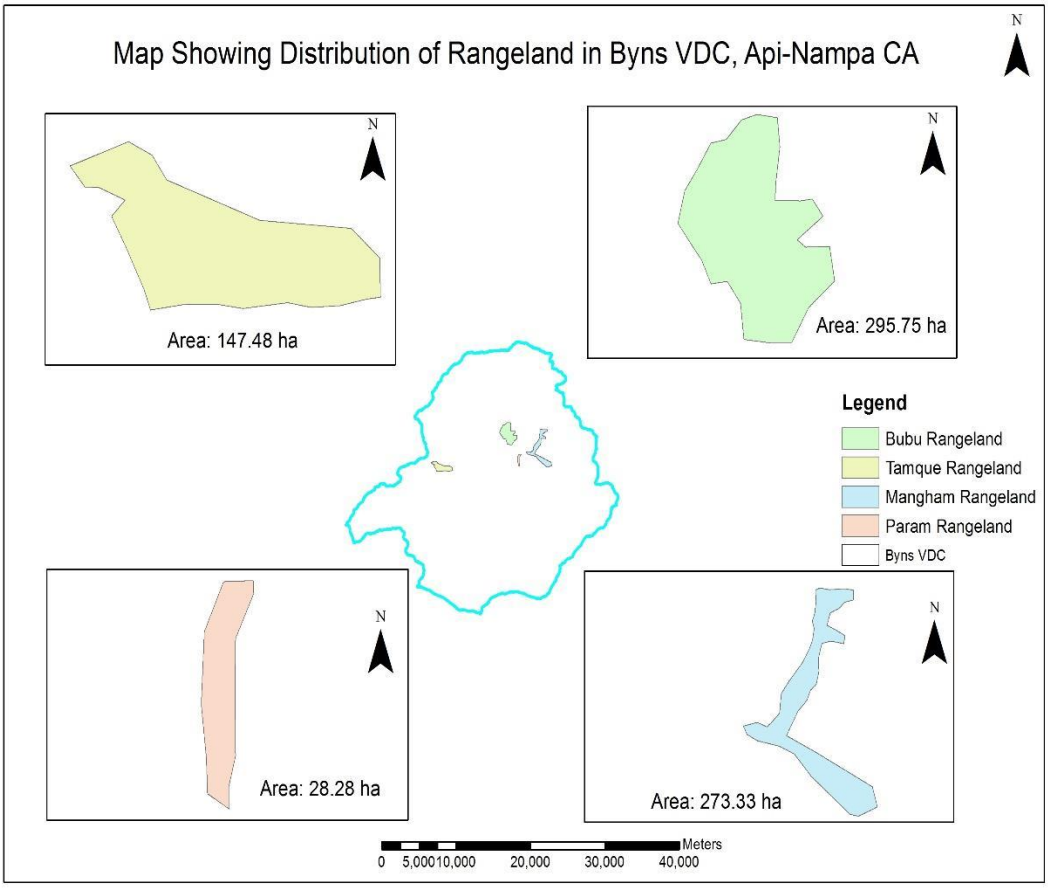
Rangelands produce a wide variety of goods and services desired by society, including livestock forage (Grazing), wildlife habitat, water, mineral resources, wood products, wildland recreation, open space and natural beauty. The geographic extent and many important resources of rangelands make their proper use and management vitally important to people everywhere.

Bubu, Tamque, Mangham, Param, Nampa are the major rangeland used by Chhangru and Tinkar people for grazing their livestocks covering an area of 1191.29 hectare of the area.

TABLE 1: DISTRIBUTION OF RANGELANDS IN BYAS RM-1

S.N.	Village	Rangeland	Area(ha)	Dominant species

1	Tinkar	Bubu	295.75	*Agrotis spp., Poa spp.*
		Tamque	147.48	*Stipa spp., Carex spp.*
		Param	28.28	*Lonicera rupicola*, *Caragana spp.*
		Mangham	273.33	*Potentilla spp., Kobresia spp.*
2	Chhangru	Nampa	418.81	*Agrotis spp., Poa spp.*
		Chhangru	41.84	*Stipa spp., Carex spp.*
	Total		**1191.29**	



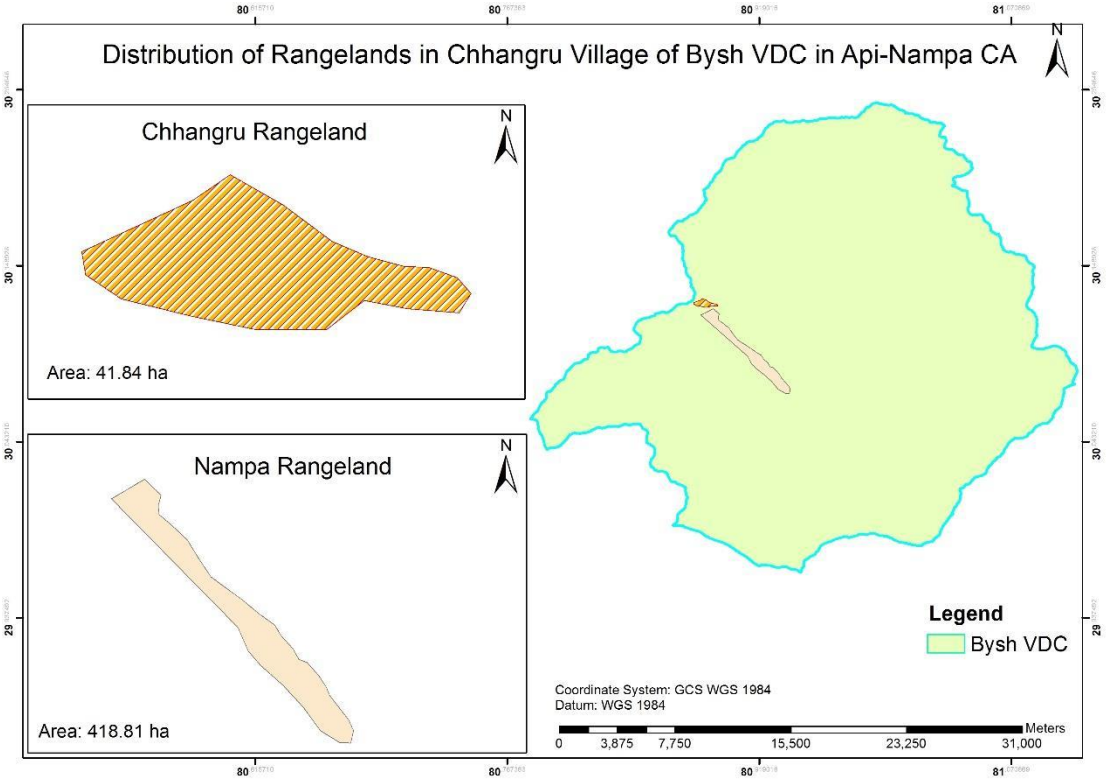


FIGURE 5: MAP SHOWING DISTRIBUTION OF RANGELANDS IN BYAS RURAL MUNICIPALITY-1.

On the basis of life forms and dominant plant species, the vegetation communities in Chhangru and Tinkar village can be classified into five different types (Aryal and Shrestha, 1997, Stainton, 1972).

Lonicera Community-found in a continuous belt on southern aspects at lower altitudes from 2500m to 4500m. A dense mat of low growing shrubs like *Lonicera rupicola*, *Caragana brevifolia, Caragana gerardiana, Austragallus* are some of the important rangeland species with grazing value growing in the desert steppes which are indigenous to the area and *Hippophae tibetana* dominates as the thorny shrub species.

Wet Meadow- found in patches near rivulets and moraines in altitudinal range of 4800m-5200m and dominated by sedges of the genera *Kobresia.*

Dry Grassland- more or less continuously distributed in most parts of northern aspects in an altidudinal range of 4850m-5500m. It is dominated mainly by different genera of

grass ad sedges such as *Stipa, Carex* and *Agrostis. Agropyrum caninum, Agrostis Ciliata, Poa spp.*

Dry Meadow- patchily distributed within Desert steppe in locally conspicuous and relatively wet spots and characterized by *Potentill fructicosa* and *Kobresia pygmea*.

RANGE/PASTURE LAND MANAGEMENT

ISSUES

In higher altitudinal range of the area, alpine meadow, grazing land with high value MAPs are profound. The local and people from lower region of the darchula district are involved in MAPs collection and trade and also in livestock herding in those grazing land and alpine meadows.

13 major alpine rangeland and more than 60 minor rangelands has been identified in ANCA of which Api besh, Nampa, Budi, Pola, Tinkar, Bolin are the major rangelands found in the area (ANCA Mgmt. Plan, 2015-19).

More than 90 percent of the revenue generation by ANCA office from these highlands meadows of four VDCs viz: Byas, Raapa, Ghusa and Khandeswori. According to ANCA official record more than 8400 people are engaged in Cordyceps collection, a valuable medicinal plant, during May-June.

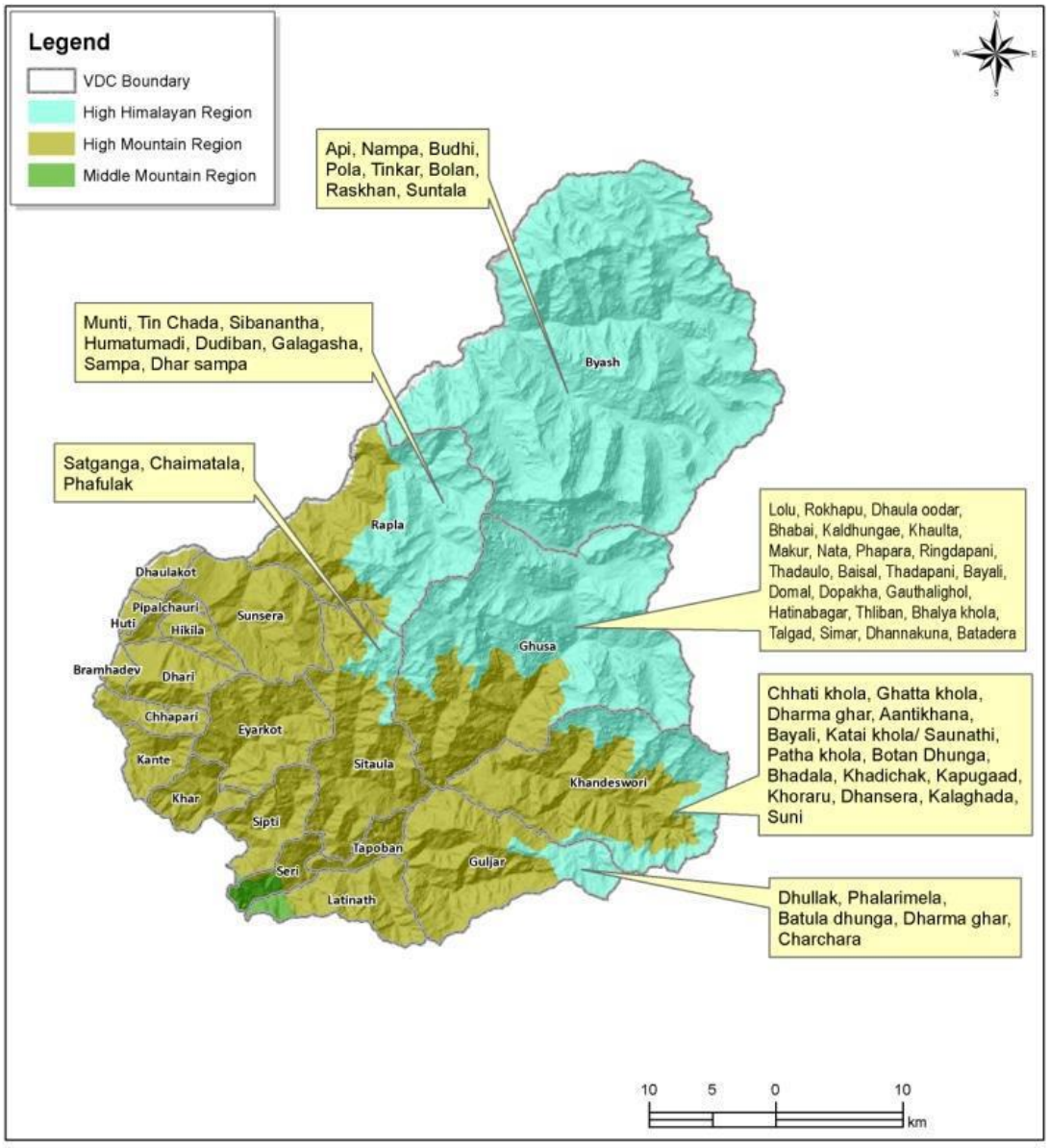


FIGURE 6: MAP SHOWING DISTRIBUTION OF RANGELANDS IN ANCA (SOUCE: ICIMOD, 2013)

Due to high pressure of human disturbance in the grazing lands and the unmanaged collection of medicinal plants in these area with loads of garbage unmanaged, rangeland health is being deteriorated yearly.

Transhumance livestock practices are a traditional way of livestock husbandry in ANCA. But due to heavy grazing in northern and eastern part of Byas VDC, the quality of grasses/forages is exceedingly degrading. In addition, changing climate impacts the

pastureland/grazing land. Lack of trail and bridge, water hole in pastureland is another issue. This puts the particular pastureland under stressed, while others left unused. The livestock diseases have become a serious threat. This has caused death of many livestock.

Moreover, this also poses risk to wild animals which co-habit pasturelands. There is an issue of unavailability of timely veteneiry services. Similarly, Inadequacy of human resources for livestock herding is another issues due to the increased seasonal migration and awareness on children's' education (ANCA mgmt. plan, 2015-16).

STRATEGY

i) assessment of quality of pastureland/grazing land for restoration
ii) rangeland infrastructure and
iii) Coordination with District Agriculture and Livestock Development Office for arranging timely veterinary services.
iv) ANCA office will provide subsidy (40-50%) to farmers/herders to buy productive/hybrid livestock.
v) ANCA office in collaboration with UGs and Local Government will provide subsidy for MAPs collectors in the region for alternate energy use.

ACTIVITIES

i) Inventory of pastureland - 4 units (Nampa, Dongkhang, Marma, doo and other)
ii) Restoration of degraded pasturelands-4
iii) Support to mobile veterinary services – 4 pastures
iv) Conduct awareness program for herders
v) 50 % Subsidy to herders in close collaboration with District Agriculture and Livestock Development Office (25 units)
vi) Support marketing of diary product
vii) Subsidy for collectors in use of alternative energy sources for MAPs collectors in the area.

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Annex 1: Logical framework

S.N.	Description	Verifying Indicators	Certifying measure	Risks and assumptions
1	Natural resource management, (Rangeland management, Forest management, NTFPs)	Decrease in pressure of rangeland use. Increase in forest cover. Proper harvesting plan for optimum production and sustainable use of High value NTFPs.	Inventory of Rangelands and development of Action Plans. Change in perception of local herders Sub sectoral plans developed for high value NTFPs	Climate change pressure is low in rangelands. Monitoring of high value NTFPs done timely.