Broghil Valley

The area mostly comprises of mountainous tracts. The elevation of the area ranges from 10765 ft at Kishmanjah village to 14121 ft at Kurambar Lake in north-east. The Last village of Broghil is called Lashkargaz located at altitudes of 12080 ft.

Climate

The climate of area is characterized as dry temperate. It is hot in summer (July-August), ranging from very hot in lowlands to warm in the uplands and cool in the higher elevations. Spring weather is unpredictable with frequent rain and snowfall. Long term temperature and precipitation records are not available for different locations. In general the area is characterized by low precipitation area.

Located at height above 10,000ft the Broghil is haunted by harsh climatic conditions. The temperature remains below freezing point for larger part of the year. Major portion of precipitation is received in the form of snow. Snow-spell starts in September and continues till late April. However, intermittent rains come in late July and early August. The average precipitation in the area has been recorded about 1,000mm (Israruddin). It remains pleasant from May to September, when the area enjoys moderate climate, while the nights still get cold due to the cold winds blow across the area.

Agriculture

In the wake of rough terrain and harsh climatic agriculture activities are practiced on limited scale. Only buckwheat is grown which also is not enough to meet even the in-house needs. It's primarily grown to supplement the fodder demands especially during the winter spell when the whole of Broghil is covered with snow and stall feeding of livestock becomes a crucial exercise. However, some ultra-poor families also include it in their daily diet. The average landholding size is quite high as compared to other parts of the district but crop production per chekorum (local unit of land size equivalent to 2.14 Kanal) is much lower.

Per chekorum of yield of buckwheat is reported to be only 2-3 mounds. Potato, alfalfa and wild beans are also grown to supplement nutritional needs and fodder production mostly at lower villages. Wild bean is grown for the main purpose of fodder production but when fresh it is also used as food item. The rest of the grain need is meet from the supply by the Local Government on subsidized rates.

Irrigation

It is usually carried through centuries old channel, well maintained by local people, fed by nearby perennial and semi-perennial streams during summer spell. Animal dung and ash produced in-house is used to enhance fertility of the agricultural lands. The compost made of animal residues is excavated in early May and spread in the fields; the field is let for months

without any agricultural practice to ensure maximum absorption of the compost nutrients deep in to the soil.

Agri-fields are ploughed by Oxen and Yaks in mid June and harvesting is carried out in late August-September. Seasonal calendar of agricultural practices is given below. No direct investment is made in agriculture sector except purchase of quality seeds which is too by few families that can afford. The agricultural produces are hardly enough to meet in-house needs only and no income is generated through the sale of agri-produces partly because of the physical isolation of the area and partly because of poor quality and scantly quantity. Agriculture and related sectors contribute only 2.5% to household economy in Broghil area.

Land Tenure System:

The land in the target area is owned either by individuals and/or by community. Individual land under cultivation and is also used for fodder collection and grazing livestock whereas communal land is used for grazing, collecting fodder, supplying of fuel wood, peat, etc.

Formal land settlement has not been done in Broghil area from the Government side. Individuals and clans have grabbed lands including agricultural fields, peatlands and pasture according to their set criteria. However, the pastures are shared without any disparity by entire community with defined localities. On farm labor opportunities are very limited as farmers plough, sow and harvest their fields on their own. Only few families have tenants to cultivate the lands. The terms and conditions for hiring tenants are the same as for rest of the Chitral. In this system the tenant and landlord equally bear the cost of the agri-inputs and crop production share.

Livestock

Livestock nurturing and husbandry practices are by-far the most important and potent sources of livelihood in Broghil area. The residents are traditionally livestock herders and grazing land is an important asset to them. They use cattle to plough farms and as a means of transporting people and goods. Livestock are an important source of proteins (milk and meat) and cash. Residents also use animal dung as fertilizer and as a source of household energy. Almost every household, rich or poor, is engaged in livestock raring and basic husbandry practices in one way or another to survive in this climatically unfriendly area. Of the total income generated, about 90% is generated from livestock raring and animal husbandry practices.

Livestock rearing is practiced for the dual purposes of fulfilling in-house daily requirements as well as generate income through trade and use for tourism purposes. Livestock also supports agriculture activities.

For the composition of livestock and trends in Livestock raring in Broghil area summarized in the following table:

S#	Village name	Yaks	Horses	Donkeys	Sheep	Goats	Cows	Oxen
1	Lashkargaz	180	16	40	400	300	23	37
2	Garil	160	9	17	231	184	36	38
3	Chilmarabad	180	16	23	400+	350	20	60
4	Ishkarwaz	72	12	16	170	150	20	16
5	Arquan	24	04	04	60	50	09	07
6	Chikar	120	15	25	350	300	60	40
7	Garumchasma	110	17	25	400	800	67	64
8	Koi	15	06	05	50	50	15	10
9	Kishmanja	30	2	03	-	130	7	-
10	Jungle	-	01	2	15	40	5	3
11	Midan	30	4	4	60	50	10	6
12	Vadinkhot	6	2	3	-	50	9	6
Total		**927**	**104**	**167**	**2136**	**2454**	**281**	**287**
%age composition		**14.58 %**	**4.73%**		**72.21%**		**4.41 %**	**4.5%**
Sources: PLA/SLA Exercises, 2008, 2009 by PWP- NAWC Team								

During months of August and September Yaks, Bulls and Goats are taken to adjacent markets of GB and Chitral for trade purposes and the cash capital thus generated is used up to buy basic amenities/commodities for the incoming cold season. Brokers from GB and Chitral also visit the area during these months to deal in livestock. Different livestock forms are reared for different purposes. Cows are kept for the primary purpose to meet the milk and dairy product requirements of the household. While Yaks and Goats/Sheep are kept with the rationale of supporting diet especially protein requirements of the household and generate cash capital through selling and trade. Oxen support the agriculture activities and substantial income also earned through their sale. The Yaks, donkeys and horses are also used as transportation means within and outside the valley and earning mean during tourist season.

Biological uniqueness of Broghil Valley

Rivers and streams

All large and small streams drain ultimately into the Chitral River that itself originates mainly from Chianter glacier and Karumbar Lake adjacent glaciers and watersheds. Some 250 Km in the northeast of Chitral town, the first main water body of Chitral River is River Broghil.

Through the course of its flow from Chiantar to Darband (a historical village some 70 KM in the southeast of Broghil valley where the Chitrali community defeated intruders from the west i.e. central Asia during the state regime) it is called Broghil River. From Darband onward it is named as Yarkhoon River.

The Broghil River collects numerous tributaries from Chiantar to Darband, locally called Xerao meaning stream. The most important Xeraos (stream/tributaries) that feed in to Broghil River from Lashkargaz (last village of Broghil valley) to Kishmanja (first village) are as follow:

4.1.1 Western Tributaries:

- **Rabat Xerao:** This by far the most important tributary of Broghil river. It also partly originates from Chianter Glacier in the extreme north and flows southwestward to join the main flow of Broghil River near Sowarsher pasture. Its flow is perennial.

- **Kahsherdoor Xerao:** It's a semi perennial streams originating from Lahleyabad pasture and flows west to east to join the Broghil River. It pours into Rabat Xerao near Irshad pasture.

- **Ganj Xerao:** It originates from the watershed on the top of Lashkargaz village and partially drains into Afghanistan in the west as well. It follows west to east to drain directly into Broghil River.

- **Yok Xerao:** It is a perennial stream flowing through Garil village into Broghil valley. Number of channels emerges from this stream to feed agricultural lands and run three water mills in Garil village.

- **Warsing Xerao:** It has its source in Wakhan (Afghanistan) and the diverted water protion flows west to east through the Chilmarabad village to drain into Broghil River. During the Dawood regime the Afghan authorities often used to stop its water supply to Broghil. Later on the Pakistan government extended usage rights of another stream in Arandu (the southern tail of Chitral district, bordering with Kunar district of Afghanistan in the southeast) to Afghanistan in return for Yok Xerao stream in Broghil. Since then no such mishap has occurred. Its flow is perennial. It feeds the peatlands on the way, agricultural lands and water mills through traditionally built channels. Its drains into Broghil River near the Junali village in the east.

- **Kishmanja Xerao:** It also flows from west to east and drains into Broghil River near Kishmanja village. AKRSP has recently established a micro hydle power station on this stream to generate electricity and supply upto Wadin Kot village only.

4.1.2 Eastern Tributaries:

- **Chokzard Xerao:** It originates directly from Chianter Glacier in the east of main flow of

Broghil valley and through the pasture of Chokzard it drains into Broghil valley. According to the local its potential site of Ibex, Snow leopard, Brown Bear and Ram Chakoor. Muhammad Syed, a local community member aging between 35-45 said that some ten-year back he personally observed a female Brown bear along with two cubs in the said Xerao. Yasin community of GB side often practices illegal poaching in this Xerao that often leads to sour relations between the two communities i.e. Broghil and Yasin.

- **Sakhirxerao:** It originates near Darkhot pass and passes through the Shakhirr pasture to

drain into Broghil. It is also said to be potential Ibex, Snow leopard and Brown bear site. The locals are often reluctant to take their livestock to Sakhirxerao due to the presence of predators.

Lakes and its ecological functions:

The Broghil valley is characterized by the presence of more than 30 small and large lakes, the peatlands areas, river broghil and the glaciers. The unique climatic conditions and extreme variation in altitude and geographic aspect has resulted in diverse ecosystems and vegetation zones in Broghil valley. This diverse range of vegetation and ecological zones also support a rich floral and faunal diversity. The Broghil valley is of high importance in maintaining a great diversity of wetlands including high altitude alpine lakes and ponds, peatlands areas, alpine pastures, riparian areas, birch, salix and juniper forests and riparian vegetation. Beside the habitat of other wildlife species, these resources collectively provide breeding ground to water birds and staging ground to waterfowl mostly in autumn and spring seasons.

Wildlife:

The alpine pastures and rocky slopes interspersed with wetlands provide congenial habitat to endangered mammals including Snow Leopard (*Uncia uncia*), Himbalayan ibex (*Capra ibex sibirica*), Brown bear (*Ursus arctos*), Blue sheep (…) Wolf (*Canis lupus*), Red fox (*Vulpus vulpus*), Golden marmot (*Marmota caudata*), and Lynx (*Felis lynx*).

The valley has a global importance as it is a gateway of Indus flyway to South Asia which provides a safe entry of waterfowl to South Asia by providing a great diversity of potential and tranquil staging grounds in the shape of lakes, ponds, peatlands, river beds, streams, and riparian vegetation. The valley is also the habitat of snail specie associated with hot springs of water bodies present in the area. The valley is still unexplored in terms of biological uniqueness and needs further identifications and explorations of unexplored wildlife diversity in the wetlands and surrounding habitat.

Forests

Degraded broad-leaved forests are encountered in certain scattered location in Upper Chitral including Yarkhun and lower parts of Broghil valley. Remnants of Juniper forests can still be seen around upper Chitral up to Broghil valley.

The existing forests in the Broghil valley are limited and hardly sufficient to meet the local demands for fuel wood and timber. The available forests mainly consist of Birch, poplar, Juniper Willow and small shrubs that cover a small proportion of the valley.

Situated on a height above tree line, very limited forests are found in Broghil valley. Small forest resources, which even not comply with the definition of forests, are mostly confined to the lower parts of the valley. Small trees and plants are found in scattered patches in lower Broghil area, which are used for construction and fuel wood purposes.

Juniper forests are found scattered from Kishmanjah village to Garamchasma. Other plant species found in the area are Willow, Birch, Poplar and small shrubs. The area is rich in medicinal herbs and shrubs.

Medicinal Plants:

The Broghil valley is rich in such type of natural assets. More than 80 medicinal plants diversity is found in the valley. The local people do use traditionally the herbs for curing the diseases both in human and domestic animals. Despite the abundance of the economically sound medicinal plants in the valley, the custodian communities are utilizing it at a very low level. The local people lack the capacity to first identify, process and then to market the valuable plants species. Being the remotest valley, no outsiders are involved in collection or marketing of the medicinal plants.

Soil

The soil of the area is loamy with low humus contents. Much of the surface of the mountain and hill slopes comprises bare rock without soil cover. The soil in the low hill valleys is shallow. Small patches contain shallow or very shallow, strongly calcareous, gravely and stony loams, that hardly supports vegetation growth. The soil is acidic with PH ranging 8.00-8.2.

Pasture and grazing lands

The lash green meadows and plains are used as pastures to graze livestock and collect fodder. Pastures and rangelands are by-far the most important Common Proper Resources (CPRs) contributing to the bulk of local economy. The major reliance on natural resource base is for grazing and collection of fodder. Foothill grazing usually continues throughout the year. Pastures especially the alpine and sub-alpine pasture are used for the dual purpose of grazing and fodder collection from early May to the end of September.

The animals are taken to high pastures in patches. During early spring season, April-May, the animals are grazed in plains and foothills located in close proximity to residential areas and the agricultural fields. But with the cultivation of the buckwheat and other agri-crops they are taken to high pastures for grazing to avoid damages to agricultural crops and capitalize on the fresh emerged forage. During this period it is ensured that livestock do not enter the agricultural fields. In order to ensure controlled grazing and a traditional system called “Sot Siri” is in practice. Similarly other traditional tools are used to ensure sagacious use of natural resources especially the pasture lands.

When the temperature further rises and greenery appears at high altitudes the livestock is taken to high pasture for grazing. In high pastures animals especially Yaks, Cows and Oxen are grazed openly without any supervision, except occasional inspection by the owners to ensure that animals are safe and sound. The goats and sheep by virtue of their high vulnerability to predators are grazed through active watch and ward by herders. Along with the animal significant portion of the local population also migrate to high pasture to watch over the animals. Yaks roam the entire Broghil area including the high pastures upto the Qarambora area. The entire livestock is taken high pasture except the milking cows.

By traditional practices and customs all villages of Broghil enjoy full usage rights in various pastures. Usage rights of different pastures have been distributed among the custodian villages of Broghil on the basis of their geographical location and number of livestock. Detail of pastures and access to usage rights in pastures are given in the following table;

Number of livestock and user rights ownership in different pastures of Broghil

S#	Name of Pasture	Usage rights (villages)	Number of livestock	Proximity and usage rights ownership
Pastures on the western bank of River Broghil				
1.	Rabat	Communal pasture, used by entire Broghil community	500-700 (mainly yaks)	Located close to Qarambara lake and used by entire Broghil for the grazing of Yaks exclusively.
2.	Bariban Margach	Lashkargaz village	1000-2000 (mixed)	It’s used entirely by Lashkargaz community.
3.	Door Margach	Garil village	do	Usage rights mainly owned by Garil community; however other communities of Broghil also graze their animals

				here. It is also observed that communities of lower Yarkhoon valley including Yarkhoon Lasht, Darband, Dobargar, etc also send their animals to this pasture for summer grazing.
4.	Lalehy Rabat	Lashkargaz village	do	-
5.	Sowarsher	Garil and Lashkargaz villages	300-500	-
6.	Irshad	Lashkargaz	300-400	Lash green meadow bordering Lashkargaz village in the south. Pastoral activities are undertaken in the pasture. It covers a large area.
7.	Rokhan Sill	Gramchasma	100-200	It is located on the eastern side of the Rabat stream that flows from North to South (one of the main tributary of Broghil river). It is well known for flash floods (Rokhan meaning White and Sill meaning flood in local Wakhi dialect).
8.	Vandanil	Chikar and Kishmanja community	300-400 (mixed)	Located adjacent to Rokhan Sill
9.	Xooyil	Garil and Lashkargaz	No EST	Potential Ibex hunting area. Ibex are often observed here.
Pastures on eastern bank of River Broghil				
10	Chokzard	Chilmarabad/Chikar	-	Reserve for future use. Another main tributary of Broghil river called Chokzard Xerao originates from this pasture. It borders with

				Chianter Glacier. The locals said that the Yasin community practices illegal hunting of Ibex here. It is also potential site of Snow leopard and Brown Bear.
11	Kamok	Chilmarabad	-	At present it is abandoned and is reserved for future use. Located in the immediate south of Chokzard pasture.
12	Sakhirxerao	Chikar and Arqoun community	200-400	Located next to Kamok. According to the locals it is potential site of Ibex. Snow leopard, Ram Chakoor and Brown Bear.
13	Barben Pasture	Chikar	-	Located close to Chikar village on the eastern bank of River Broghil. It is used as a transitory pasture while moving to high pastures. Majority of livestock taken to this pasture comprised of goats and sheep.
Sources: Local communities of Broghil valley and PLA exercise by PWP-NAWC team.				

Peatlands

Peatlands by definition refers to the accumulation of partially decayed vegetation matter over a vast span. Besides acting as grazing lands, historically the most common use of peat in Broghil valley is as a primary source of fuel. Its exploitation as a fuel for domestic use began at least 75 years ago when peatlands were more widespread in the area and the locals through a migrant from China came to know to be used it as a fuel source as well. Sine then peat has been the traditional domestic fuel in Broghil valley. Being most vital source of fuel in remote areas like Broghil, the peatlands also performs some crucial ecological roles like water storage points, offering habitat for migratory birds, source of fodder for livestock as well as for wildlife

and the major sink for greenhouse gases at that altitude. In the **climate change** phenomenon the peatlands are of prime concerns in these parts of the globe. In the last 40 years the peatlands ecosystem in Broghil valley has been under tremendous pressure due to over exploitation to meet in-house energy/fuel needs of the local populace living permanently upto altitudes of 12000 feet above sea level.

A significant proportion of the peatlands have been used up and the practices are increasing with every increase in population figure there. Pressure on the remaining peatlands ecosystem is climbing day by day and hence on the natural habitat of the associated wildlife. Some of the villages in Broghil valley including Chikar and Iskarwaz have extracted almost 90% of their share in peatlands. Now these villages are fulfilling their fuel requirements from the communal owned peatlands areas. The use of peat also varies from hamlet to hamlet within Broghil valley. In villages located at lower elevation e.g. Kismanjha, Jungle, Pechuch (Garamchasma), Koi and Vadinkhot the primary sources of energy are fueld wood, animal dung and agriculture residues. Peat is used as secondary source of fuel in these villages. This is due to the fact that some remains of birch, willow and juniper forests still exist in these villages or nearby areas.

According to the estimates if the present rate of peat consumption continued, then it is estimated that after 20-30 years all the peatlands will be turned in to wastelands

Natural resource use trends in Broghil valley

Months	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Critical months**
Natural resource													
Fuel wood													
Use	3	3	3	2	1	1	1	1	1	2	3	3	Nov, Dec, Jan, Feb, Mar
Supply	1	1	1	2	2	3	3	3	3	2	1	1	Jun, Jul, Aug, Sep
Water													
Use	1	1	1	2	1	3	3	3	3	2	1	1	Jun, Jul, Aug, Sep
Supply	-	-	1	1	2	3	3	3	3	2	1	1	Jun, Jul, Aug, Sep
Peatlands													

Use	3	3	3	2	2	2	1	1	2	3	3	3	Oct, Nov, Dec, Jan, Feb, Mar
Supply	1	1	1	1	2	3	3	3	3	3	2	1	Jun, Jul, Aug, Sep
Medicinal plants													
Use	3	3	2	2	2	1	1	1	2	2	3	3	Nov, Dec, Jan, Feb
Supply	-	-	-	1	1	2	3	3	3	2	1	-	Jul, Aug, Sep
Hunting													
Birds	2	3	3	2	1	1	1	2	3	2	2	2	Feb, Mar, Sep, Oct
Mammals	3	3	3	2	2	1	1	1	1	1	3	3	Nov, Dec, Jan, Feb, Mar
Grazing													
Fodder collection	-	-	1	1	2	2	3	3	3	2	1	-	Jul, Aug, Sep
Pasture use	-	-	1	2	2	3	3	3	3	2	1	1	Jun, Jul, Aug, Sep
Source: PLA and questionnaire survey													

Water

Water is important natural asset for the local communities of Broghil by being the critical demand of agriculture, livestock, wildlife and humans. The channel drawn from perennial and seasonal stream serves to feed the agriculture lands and livestock. Besides, seasonal movement between permanent human settlements and pasture is also determined by the availability of water. During drought and dry periods when rains are scantly, springs are desiccated premature and snow melts earlier movement to high pasture is restricted and animals are kept close to the permanent human settlements and water sources.

The demand for water supply is highest from June to the end of October due of enhanced agriculture activities. During these months minor conflicts over the distribution and allocation of water share also emerge. These conflicts are managed locally through village elders.