Pastoral Systems in Hindukush-Himalayas of Northern Pakistan

Draft Report

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by

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Introduction:

Pastoral areas denote all lands use for grazing and forage harvesting. It includes rangelands, pastures, field borders, canal, river, stream and roadside grazing areas. Lands suitable for grains and cash crop are not worth consideration directly for fodder production, in the era of ever increasing human population. Thus a given quantity of grain eaten directly will feed five times as many people, as it will, if first fed to livestock and then livestock products are consumed. Similarly considering forage-producing areas for timber and game production would not be sustainable. Pastoral Systems are systems of natural resource use in which free grazing or grass fed animals are the principal means of exploiting the resource. It comprises of natural system containing the resource on offer (interaction of landforms, climate, flora and fauna), user system exploiting the resource (individually and corporately) and larger geo-political system in which the resource users operate (state policies and institutions, economics and other external forces). Fundamental to successful long-term improvement in livestock production in pastoral system is the adoption and implementation of a strategy addressing the needs and priorities of the actual resource users, while recognizing the interrelationship of the physical and biological environment. The technologies identified for intervention must be compatible with the target system including the compatibility to the local fragile socio-political balance.

As new criteria and priorities are proposed, they must remain consistent with the capabilities of grasslands to produce a combination of goods and services needed by humankind on sustainable basis. However, the more realistic objective is a continued, high output of animal products. This requires an understanding of both how grassland affects animal performance and also the effect of grazing animals on the capacity of grasslands to persist, grow and provide nutritious feed. Grazing on pasture and rangelands is quite logical, since grasses and animals have co-adapted throughout evolution. Where animals are prevented from grazing, the soil from a crust (capped soil), which prevents rain and minerals from infiltrating the soil and increasing the run-off. The hooves of grazing animals disturb this crust and facilitate the germination of new grasses, by covering their seeds; preparing the seed bid and facilitating the infiltration of needed water and minerals. In addition grazing animals also break all the non-edible plants standing litter and mix it with soil along with their dung and urine, thus aiding to the fertility of soil. Soil-conservation/erosion-control is accomplished more effectively by pasture crop than by any other means. Pastoral system will continue in the face of economics and social changes to conserve the land and assure the food supply of the desired quality, quantity and variety. At its best, it calls for trans-disciplinary approach for knowledge and application of soil, plant and animal sciences.

Pastoral systems are the most dominant land use in NWFP (Northwest Frontier Province) with rangelands being principle component. In the mostly hilly province feed for livestock is not only derived from grassland but fodder crops and crop residues also contribute significantly. The northern mountains (Hindukush-Himalayas) in NWFP covers the districts of Swat, Dir, Chitral, Buner, Malakand and Shangla on the West Side of the Indus, and Kohistan, Mansehra, Batagram, Abbottabad and Haripur on the East Side of River Indus. The region occupies more than 40% of the territory of the NWFP. In the region, approximately half of the land areas are composed of rangelands. Keeping this in view, a study was designed for different pastoral systems in the region with the following broader objectives.

1. To explore the pastoral use pattern in different ecological zones
2. To facilitate pastoral grazing groups in articulating their policy, legal and institutional concerns
3. To prepare policy brief for the decision-makers
4. To use the study in designing advocacy campaign on rights of pastoral groups.
Methodology

During the study, different pastures were visited and pastoral use pattern was evaluated. At each pastoral region, 2-3 pastures were visited in order to work according to the broader objectives. Alpine/Sub-Alpine zones were subjectively selected. After preliminary preparations in May (interviewing format attached), each zone was visited during June and September, when all the immigrating transhumant population was at upland pastures. 2-4 days were continuously spent at each zone before visiting the next zone. The needed information was collected through group interviews, questionnaire and interviewing key informants. Necessary supporting documentation was carried out in each pastoral zone. Different participatory appraisal tools were used during the study and modified according to the situation during the course of study. At the end of the field visit preliminary information were compiled in the form of a draft report after transforming them to appropriate format including comparative zonal as well as general inferences drawn. The generated information was presented to an appropriate forum of stakeholders (institutions, experts, donors, economic actors, owners and users) to workout options for adaptable strategy. The results were finally presented in the form of a comprehensive report.

Initially the information about dependent livestock population, herd-size and herd-dynamics, and marketing were scheduled through questionnaire. The transhumant and nomadic sheep and goat pastoral group (Ajarhs) primarily depend for their livelihood upon livestock. The local pastoral groups had the tradition that they avoid indicating the number of animals in their flock due to fear of bad sight. Furthermore, they never show the number of animal sold due to fear of taxation. They were only willing to indicate the number of casualties due to diseases or accidents. Such information was then collected through indirect means using participatory appraisal tools. Secondary data where available was also collected and included in the report. Personal observations through the course of study by different team members have also been incorporated. The participatory appraisal tools were modified according to the capacity of respondents through the course of study. Despite all these efforts the tight schedule and expanded spatial scope of the work to be covered through a single pastoral occupation season may have caused skipping of some important information required to be incorporated in the study.

Broader categorization of pastoral systems and pastoral groups

Two broader categories of pastoral systems are sedentary and mobile and both types are prevalent in the region. Sedentary pastoral systems are prevalent in rain-fed hillside gentle slopes and inside semiarid to sub-humid narrow valleys. Mobile pastoral systems are a natural adaptation to the unreliable supply of feed and any action that restricts the mobility is detrimental to mobile pastoral system. A greater proportion of the area receives sufficient and well-distributed rainfall throughout the summer forage-growing season.

In its humid and sub-humid zones, little arable farming is possible. Most of the settled population, with their small land holdings, is scattered on gentle slopes. They are traditionally involved in sedentary pastoral system and are more dependent for their livelihood on livestock. Transhumant and nomadic pastoral groups traditionally utilize most of the pastures and rangelands in other zones. Where pastorals have minority status, they inevitably become marginal and face the threat of acquisition of resources for majority interests. Sectoral planning increases that threat as pastoral economics are perceived to have no competitive edge. They are treated as a low-grade extension of the livestock economy or as risky partners in wildlife based eco-tourism. Out of all possible objectives for range management, including erosion control commercial enterprise
through livestock production generally provides most effective drive, motivation and direction in developing range management as an attractive, sustainable and successful profession.

Pastoral groups in Hindukush-Himalayas of NWFP can be categorized into the following main groups:

- **Nomadic pastoral groups**: They may or may not have a permanent residential location, but they have no regular upland or lowland pastoral areas. They mostly move with their entire families and have primary pastoral dependence for their livelihood. In its classical form true nomadic pastoral groups i.e., without residence and regular pasture now rarely exists, however semi-nomadic or transhumant pastoral groups may become nomadic and vice versa due to some shocks. For example, the Afghan transhumant, Fat tail shepherders have turned to be nomadic after the initiation of Afghan war.

- **Semi-nomadic pastoral groups**: They either have upland or lowland permanent pastoral area mostly with permanent residential location. They may move with part of their families and have primary pastoral dependence for their livelihood. In some situations mainly with goatherds, only male members migrate particularly when long distances or difficult terrain has to be covered.

- **Transhumant pastoral groups**: They have permanent upland and lowland location for their grazing and may have a permanent residential location at both the areas. They may move with part of their families and have primary pastoral dependence for their livelihood. In some situations, only male members migrate. Those with chance to have a family member abroad are gradually shifting to trade or cropping.

- **Semi-transhumant pastoral groups**: They have a permanent residential location at both the areas and are commonly the pasture owners. They partly move to nearby upland areas with non-lactating herd-members and usually have secondary pastoral dependence. They may move with part of their families and have primary pastoral dependence for their livelihood. In some situations, only male members migrate.

- **Sedentary pastoral groups**: They permanently reside in the vicinity of pastoral area and graze their animals through a common herder during specific periods of the years. Different social groups usually have variable dependency on pastoral system. They mainly include the beef cattle herder *Gujars* having purchased land ownership or leased lands with their residence on hillside surrounded by grazing areas.

The Alpine and Sub-Alpine pastures in Hindukush-Himalayas can be physically broadly grouped into five categories.

- **Swat and Dir upland pastures** characterized by mainly transhumant and semi-transhumant goat and sheep grazing, mostly direct and intermediaries level access to open livestock market, communal pastoral ownership of owner-users and absent landlords, winter diverse scrublands grazing dependence, and intermediate/short to and fro pastoral movement through forest.

- **Chitral upland pastures** characterized by mainly semi-transhumant and transhumant goat, sheep and cattle grazing, access to close livestock market, communal pastoral ownership of owner users, winter crop residues, *Artemesia/Quercus* and tree leaves/hay dependence, and short/long distance to and from pastoral movement mostly without forests.

- **Chore upland pastures** characterized by transhumant, semi-transhumant and semi-nomadic cattle, buffalo, sheep and goat grazing, access to open livestock market through intermediaries, communal pastoral ownership of owner-users and absent landlords, winter diverse scrublands grazing and crop residues dependence and intermediate distance to and fro pastoral movement through forest.
• Indus Kohistan upland pastures characterized by absolute semi-transhumance of owners as well as user groups, mainly goat and cattle grazing, access to open livestock market through intermediaries, communal pastoral ownership of owner users, winter scrublands and *Artimesia* dependence, and short/intermediate to and from pastoral movement through forest.

• Kaghan upland pastures characterized by transhumant and semi-nomadic and transhumant goat, sheep and cattle grazing, mostly direct and intermediaries level access to open livestock market, mainly absent landlord pastoral ownership, winter diverse scrublands grazing, and long distance to and from movement through forest.

**Main Pastoral Regions**

1. **Swat and Dir upland pastoral systems:**

   • **General Farming Systems and trends in the region:**

   Although not particularly relevant to the main theme, however a brief discussion about farming system will aid in understanding pastoral system in the region in a larger frame of reference. On geographical basis, six main farming systems can be identified in the region. Different farming systems are evolutionary adaptation to provision of occupied ecological niche. Urbanization process has further affected these systems particularly in accessible areas with good communication. The impact of urbanization may be directly proportional to the ease of access. The seasonal differences at different elevations have further facilitated the promotion of commercial farming system.

   1. This is the new and gradually evolved/extendi ng system after initiation of the process of urbanization in the region since the past fifty years. The peri-urban farming system is characterized by vegetable and fodder production with sporadic staple crops for the landowner subsistence. The big landowners mainly do all the activities through agriculture labor predominantly on cash payment, while majority of the small landowners cultivate themselves with casual paid labor. The tenant leases the irrigated land on cash payment solely for commercial vegetable production. The intensity of cash/grain crops decreases with increasing distance from the city center in case when landowners utilize land, while for the livestock herders the reverse is valid. The reason may be that landowners produce cash crops for commercial utility, while they keep livestock for subsistence level. The *Gujars* of peri-urban areas on the other hand are commercial dairy producers hence devote more land to fodder crops. Both the big and smaller landowners depend principally on the non-farm urban earning activity. The agricultural labor and tenant families also distribute and simultaneously shuffle their labor between farm and non-farm sectors on seasonal basis. Buffalo is the main species on irrigated areas, while cow combine with it in the rain-fed areas toward the hillside. Lactating goats are also common with poor farmers residing on the steeper peri-urban and sub-urban hill-slopes. The feeding system of cattle and buffaloes is principally based on crop residues (wheat and rice straw) and purchased concentrates from the market. Lactating goats mainly depend on browsing, kitchen vegetable byproducts and tree leaves feeding (*Ailanthus chinences*) procured from roadsides plantation free of cost.

   2. Main valley irrigated farming system has rice plus wheat/legume fodder alternation-cropping pattern on the riverbank. After this zone are vegetable and orchard production zones. At the lower valley, the vegetable production starts earlier than the season of production at higher elevation mainly due to temperature variation. Hence, the vegetable production expands temporally to maintain a constant supply to the market over a longer duration. The livestock production similar to the peri urban system except that it is principally at subsistence level.
The commercially dairy herder Gujars are sporadically concentrated at different location and transport fresh milk to the cities for sale on daily basis, however they generally have smaller herds of 10-25 buffaloes as compared to the larger peri-urban dairy herds. With increasing elevation, the significance of hay and fodder tree leaves increases in the feeding schedule due to prolonged winter and little availability of crop residues. Orchards under-storey grazing also contributes to the feed and are now recognized as complementary activity with more fruit bearing in the subsequent year. Toward the North and side valleys the system gradually merges with gentle terraced farming system and with rain fed subsistence tenant system toward the northern side valley and with transhumant sheep and goat herding system toward the south. The tenant/landowner relationships are still partially on sharecropping and partially on cash basis.

3. Maize and wheat cropping characterize the rain-fed subsistence tenant system. The tenant occupy the areas with more cultivable areas, while the Gujars occupy the areas with more grazing area. Female members of the family are mostly involved in farming activities, while most of the male do the non-farm wage labor activity or collecting fuel-wood for sale in the nearby villages and small towns. Livestock is the most important risk avoidance mechanism under the variable rainfall. When the crop fails to bear grains, it is harvested for livestock feeding and increased subsequent livestock number avoids the risk. Beef cattle are the main component of the herd. Crop residues (maize stalks and wheat straw) and concentrates characterize the feeding system. During good rainfall hillside grazing significantly, contribute to livestock feeding. Lactating goats are more numerous, consume the tree leaves, and do browsing the nearby hillside. Stubble is carried out for longer duration than the irrigated system, as the farmers have to wait for rainfall before re-sowing. The agricultural production (inc. livestock) and the standard of living are in a downward spiral, due to lack of land, labor and money. This situation is called the “Barani trap”.

4. The gentle slope terraced mixed farming system is relatively complex and is the main characteristic farming system of almost all the narrow side valleys. It is characterized by more dependence on livestock than crops. In general, cropping tends to be concentrated on gentle, less erosive slopes with deeper inherently fertile soils, having tendency for moisture retention. On the other hand, rangelands mainly have highly erosive, shallow, badly gullied, stony and poorly drained infertile soils. Thus in a single locality, the croplands may be intermingled with less favorable grazing lands. Agricultural production is much less due to limited arable lands and less irrigation possibilities. Rice is cultivated at the valley bottom on streamside terraces and alternated with wheat, while at the rain-fed or spring irrigated hillside gentle slope maize and wheat is alternated. The valley bottom has two crop wheat and maize/rice per year, while the upper hill slope and shaded areas do have a single maize crop. The landowners keep mostly stall-fed buffaloes for subsistence through crop residues or hay collected from cropland boundaries. They occupy the most fertile foothills/valleys. The less fertile agricultural soils are leased to or owned by tenants. The least fertile lands with only grazing and browsing potentials are occupied by Gujars. The Gujars keep cows and goats and depend mostly upon livestock production. The Gujars livestock depends more on grazing followed by browsing, hay making and lopping. The farmers send their animals for grazing, to the hillside rangelands during spring and summer. The fodder shortage for winter is met by hiring paid labor from down stream areas to help the family labor during hay harvesting seasons from the protected hillside during September. Grewia tree leaves are of significant importance to the feeding regime during winter scarcity periods. Mulberry and Celtis leaves are used in addition during the summer scarcity period (in the hotter areas).

5. The Kohistanı system is characterized by mono-seasonal cropping, either of maize or off-season potato/beans/turnip. The dependence on livestock is more but decreasing and different
environmental niches are simultaneously utilized during short summer duration. Livestock and part of family proceed to the nearby upland pasture for summer grazing, while fresh *Quercus incana* tree leaves and hay/dried tree leaves are fed during winter. The steep slopes are mostly covered with patches of oak (*Quercus* sp.) and blue pine (*Pinus wallichiana*) forest. The protected pastures are situated in/near the arable lands at the valley bottom and are harvested for hay in September. In winter livestock depends on intensive stall-feeding. The introduction of cash crops replacing maize and wheat has reduced the crop residue availability for winter-feeding and crop residues are now shifted from down areas. The far away range lands are not harvested for hay and are under used due to labor shortage or labor inefficient hay collection, while the fodder trees are often over used.

6. The Transhumant/semi-nomadic system is the main commercial traditional production system. The population of sheep and meat type goat is principally limited to transhumant herders, and they are solely dependent on grazing and browsing on hillside except in winter, when tree leaves are fed during rainy days, and where no grazing and browsing is possible. Few Nomad/transhumant with cattle spend the winter in downhill, irrigated plains, feeding mostly crop residues particularly sugar cane tops in return for their sugar cane harvesting labor, have lower dependency on rangelands. The nomadic shepherds used to move between summer upland alpine pasture in upper Dir, Dir/Swat Kohistan and Laspur area in Chitral, and low land winter ranges in the lower Swat, Dir and Buner valleys. The owners lease the faraway low elevation hill slopes to nomads for 5-6 month during winter. They spend 4-5 months during summer at upland pastures (also on lease basis). The limited feed availability at low land winter range is the limiting factor to their flock size. The sheep dominant flocks go for winter grazing to Lower Swat and Dir, whereas goats can be found mostly in Buner and Malakand. The observed trends are that the winter grazing areas are decreasing rapidly in area due to plantation activities (by owners in collaboration with Forest Department and Projects) and cropping extension to hillsides.

There are clear zones of crop systems with respect to altitude, slope and aspect, water availability and soil conditions, while fertility is mainly maintained with manure and casual chemical fertilization. Different ecological zones are inter-linked, constituting a multi-community subsistence unit. The internal transactions in such a unit are regulated by both barter and monetary system. The common characteristics of the traditionally internalized system is the use of local resources in such a way as to support the internal consumption of the rural community as well as for exchange, along with maintaining the productive capacity of the resource base. Production is mainly aimed for subsistence at household or community level. Peasant household also remains involved in food processing (*yogurt, whey* and *ghee* etc) for subsistence or exchange with the other zones for grains. The trends in the system are toward market oriented externalized system based on production for the market and obtaining all the inputs from it. The economic base is shifting to remittances and at present almost every household contain a migrated remittances earner. The phenomenon of migration is complex and based on accessibility and migration costs. The marginal social segments used to migrate to local towns and cities or coal mines and sugar mills for labor. The well-off residents are migrating to Southeast Asia and Western countries. Migration to Middle East is however uniformly distributed among different social segments. The farming is now considered of secondary importance by the landowners. There is tremendous land ownership transformation toward the purchaser tenants and herders particularly the rain-fed hillside and sloping lands. The plain irrigated fertile areas are rapidly being covered with concrete building constructed mainly through remittance money and a household with more children is considered advantageous in terms of more future labor for remittances earning. This result in remittances based population explosion at a comparatively faster rate.
Pastoral Sub-systems in the region

Different pastoral sub-system identified include:

1. Mahodand/Mankial/Bishigram goat grazing transhumant pastoral subsystem. Steep sloping hillside with sporadic pasture stripes and narrow glaciated bottom valley characterize the subsystem. The valley bottom is grazed by semi-transhumant owner users mostly cattle or mixed herds, while the steep sloped pasture stripes are leased by transhumant goat herders. The Mahodand pastures are mostly under the communal ownership of Ushu/Matiltian Kohistani’s, while some pastoral areas are under the purchased ownership of Kohistani’s belonging to Kalam. The Mankial pastures are mostly under the communal ownership of resident Gujars and Kohistani’s. They utilize the valley bottom for their cattle/goat herds, while transhumant goat herders for summer grazing lease the remote sloping areas. The Bishigram pastures are under the communal ownership of Toorwali Kohistani’s residing in the area. The valley bottom is used for subsistence maize/hay harvest, while the steeper down valley side areas are used for cattle grazing by settled owner users. Transhumant goat herders for summer grazing lease for summer grazing lease the remote upland areas.

2. Shahibagh/Kundal lake/Gabral nomadic/transhumant goat grazing pastoral subsystem. Steep sloping hillside with sporadic pasture stripes and narrow glaciated bottom valley characterize the subsystem. In the Shahibagh to the valley bottom and gentle hill slopes off-season vegetable production is extending, and the steep slopes and marshy valley bottom is used for goat and cattle grazing by Kohistani semi-transhumant owner users belonging to Utrore village. The anterior high elevation steep sloped pasture stripes are leased by nomadic and transhumant goat or goat/sheep mixed flocks owners. Transhumant/nomadic goat flocks for summer grazing exclusively lease the Kundal lake pastures. The Kundal lake pastures are under the communal ownership of Kohistani’s belonging to Utrore. The Gabral area steep slopes pastures are owned by Gujars residing in Gabral valley. The owner Gujars goat/cattle flocks and nomadic/transhumant goat or goat/sheep mixed flocks jointly uses these pastures for summer grazing. The Mankial valley upland steep pasture-stripes are communally owned by sedentary Gujars. They reside in the valley bottom and mainly nomadic/transhumant goat flocks owners for summer grazing lease the pastures.

3. Loi Panghalay/Daisan, sheep, goat and cattle nomadic and owner user pastoral subsystem. Gentle sloping hillside pastoral areas characterize this subsystem. Different livestock occupies different ecological niches. The goat flocks occupy the high elevation steeper areas. The sheep flocks occupy the gentle sloped niches with limited grazing potential, while cattle occupy the gentle areas with highest grazing potentials. The cattle mostly belong to the semi-transhumant owner users, while sheep and goat flocks mostly belong to nomadic or transhumant pastoralists shifting during winter to Southern part of Malakand Agency during winter. The Loi Panghalay belongs to the Kohistani’s of Utrore under communal ownership, while Daisan belongs to the Kohistani’s of Kalam under communal ownership. Due to repeated closure of both the pastures due to disputes on distribution of lease money, only nomadic pastoral groups both local and Afghani visit the areas with their flocks during summer.

4. Daral/Saidgai/Osherai/Kumrat sheep, goat and cattle grazing transhumant pastoral subsystem. Daral pastures traditionally belong to the Toorwali Kohistani’s of Behrain. However, due to limited direct utility the transhumant shepherders occupying the region during summer with out leasing. Furthermore, the landowners are more dependent on tourism since ex-state times, hence never inclined to forcefully confirm their ownership over Daral pastoral area. Saidgai pastures are attached to Daral pastures but lying in the territorial limits of Dir district. The status of ownership and use pattern is similar to Daral pastures. Sheep
flocks predominantly use both these pastures. Kumrat pastures belongs to the sedentary Kohistani’s residing in Thal/Lamotai area of Dir Kohistan. The transhumant/nomadic sheep and goat flock owners lease the pastoral area for summer grazing and strategically occupy different ecological niches for grazing of different livestock species. The sedentary pasture owner Kohistani also sends their non-lactating herd-members for grazing to Kumrat pastures.

5. **Gabral transhumant owner users cattle grazing subsystem.** The transhumant cattle herder Gujars owns the region. They used to shift during winter to irrigated sugar cane producing area of Peshawar plains. The wider valley bottom and surrounding arable gentle to steep slopes are rapidly transforming into potato producing fields and the livestock based subsistence is rapidly changing to cash crop base. The changing land use has enormous environmental implications.

6. **Bahan/Buyon/Daisan semi-transhumant owner users cattle and goat grazing subsystem.** Semi-transhumant owner users exclusively use these subsystems and they sporadically allow the nomadic flock owners to lease some pastoral stripes in the region.

Out of the 6 subsystem, three are selected for detailed evaluation. These include Mahodand pastures, Shahibagh pastures and Gabral pasture subsystems. For Daral region secondary data is already available in sufficient details, hence reasonable amount of information could be made available.

- **Pastoral groups and pasture ownership pattern**

Different pastoral groups visiting the pastoral areas include different groups of local Kohistani and Pukhtun landowners, Transhumant cattle herders called Gujars, Transhumant sheep and goat herders called Ajars and Afghani fat tail sheep (Balkhi) herders. The landowner Kohistani and Pukhtun are the powerful political groups, followed by sedentary and semi-transhumant Gujars and transhumant Ajars. The nomadic Ajars are the most marginal and most vulnerable social group. Different pastoral groups have variable access rights, different low land grazing lands, diverse ethnicity and sociological backgrounds, and variable dependency on pastures. These groups variably make ad-hoc or long-term tenure agreements driven by the monetary benefits to be accrued by those with established ownership rights over pastoral areas.

The Kohistani landowners occupy parts of Swat (Chail, Behrain, Ushu Matiltan, Kalam, Utrore) and Dir Kohistan (Kalkot, Thal, Lamothai). While the annexed pastures to the south are claimed and maintained mainly by Pukhtun and partly by Miangan (religious groups) residing in central side-valleys of Swat (Sakhra, Beha Rorhinga, Miandam, Madayan) and Dir (Osherai Dara, Shiringal, Niag Dara, Barawal, Lawarai). In some parts, sedentary Gujars have also established their ownership (Mankial, Pishmal, Liekot and Gujar Gabral). These original pastoral landowner groups have gradually shifted through subsistence cropping to cash cropping and tourism. With the extending market, their main stay on livestock has gradually shifted and they generally became lesser and lesser dependants on pastures. The Pukhtun in many localities in Swat are absent landlords, that may have casually visited the pasture, they claim if ever for excursion purposes. In Osherai and Niag Dara of Dir valley they still partly depends on cattle and goat pasturing.

The landowner Gujars originally nomadic cattle herder pastoral groups, while visiting the region since long claimed the ownership of disputed, unclaimed and remote areas not much feasible for cropping. With increasing sedentary livelihood they gradually shifted to subsistence mixed livestock/corn and finally to cash crop dominance with decreasing dependence on livestock and pastures. Their social association with other Gujar social groups has now reduced and they are at present establishing closer relations with Kohistani landowners. The cattle transhumance has
drastically reduced with increasing cropping extension to previously gentle and irrigated pastures, on which cattle grazing primarily depended. The cattle transhumant herders have predominantly ended into peri-urban commercial milk producer Gujars.

The transhumant Goat flock owners are the dominant pastoral group in the region and goat number has seen little reduction in comparison to cattle and sheep herds/flocks. The reduction in sheep flock numbers is attributable to privatization of relatively gentle sloped low land winter rangelands for rain-fed cropping and afforestation. The goat on the other hand are adopted to steep topography and scrublands both at upland and lowland grazing areas, hence still dependable in the era of increasing human population. The nomadic system previously depending on free grazing everywhere has now greatly reduced and has converted into transhumance with the decreasing availability of particularly upland pastoral areas. Previously the transhumant repeatedly stayed at a particular low land rangeland and visited different upland pastoral areas. Nowadays the order has reversed i.e., they repeatedly visit the same upland pasture, and while still keeping their family at previous lowland occupation they move their herds to remote downward areas with increasing distribution of communal lands and hillside closure for afforestation.

The Afghani Bulkhi shepherders are adapted to arid region of southern part of the province (Dera Ismail Khan, Kohat, Bannu) and eastern/central Afghanistan. They shift to the central Afghanistan Mountains during summer and Potohar/Southern part of NWFP during winter. During Afghan war when the summer pasturing areas in Central Afghanistan were no more available, they opted to visit to Dir and Swat upland pastures with their flocks during summer. They usually are ready to pay more lease amount, however they exploit the resource destructively. As reported by the Kohistani landowners, the Afghans are blamed to spread common salt over a pastoral grazing area and allow their flock to graze it. The sheep in search of salt graze the pasture to the base without discriminating palatable and non-palatable vegetation. Although the uniform grazing of vegetation for short time would be desirable, but the salt accumulation may lead to drastic reduction in the vegetation cover especially the plants with limited salt tolerance. Such allegations could not be confirmed as any Afghani herder could not be interviewed in this connection. The Afghans occupation of the Malakand/Dir pastures has however, now greatly reduced with the transforming socio-political situation inside Afghanistan.

- **Pastoral occupation pattern**

The mobile pastoral systems are practiced in the region since pre-historic time. Ptoelmy says that when Alexander forces could not locate the access route to the Rock City (Aornos) on river Indus Right Bank, he gave some gold coins to a goat herder to help them in locating the route. Asakinoi occupying the region before Alexander invasion for extended period produced horses on commercial lines in the region probably depending on free pasturing. When the Alexander forces occupied different fortresses in the region, the local population flew away to the hillsides, leaving behind more than 3 million cattle. This reveals a shift from horses to cattle and sheep/goat production before Alexander’s invasion through pastoral system. The Buddhist period after Alexander says of grain production on the riversides in the main valley. After Mahmood of Ghazna the Swati tribe residing in the region promoted irrigation and the cropping was extended to gentle slopes. After Yousafzai occupation the tribal society and communal ownership led to gradual reduction in the cropping as the irrigation system developed by Swati has little evidence of improvement in irrigation channels.

Some historians think that the Gujars and Kohistanis migrated from Central Asia after 670 AD just after the end of Hun period. Both were initially pastorals, however Gujars were ethnically
more depended on livestock, while Kohistani had tasted the ease of cropping and sedentary system after occupying the area and in the due course of time they were pushed upward by the subsequent infiltrators of Afghan tribes from west. There was a high degree of dependence of the local population on livestock and nomadic/pastoral systems existed in the region beside forest, orchards and subsistence level grain production. The available literature reveals little about the pastoral occupation pattern during different historical period, however most of the production seems to have principally aimed for subsistence rather than commerce. The main exchange items were milk and wool products and handicrafts.

Before inception of Swat State, limited number of nomadic pastorals had access to the Swat Kohistan upland pastures. The reason was the frequent threats of looting and snatching of livestock by tribal warriors. Those occupying the southern hill slopes bounding Mardan and Sawabi plains in majority of situations proceeded to upland pastoral areas of present Hazara and Kashmir. After Swat State consolidation, the prevailing peace in the region attracted many nomadic pastorals for summer grazing and the nomadic Ajar/Gujar pastoral system gradually extended and flourished in the region. Many among such groups started leasing the rangelands on gentle slopes of lower Swat valley for winter and gradually became transhumant in nature.

The circulatory communal ownership of lands before state consolidation, the Gujar and Ajar could not possess lands or houses ownership. Hence principally they were nomadic, however transhumant pattern did exist based on long term social association of landowners and users. In Kohistan area i.e., between Kedam and Liakot down Kalam as well as in Gujar Gabral, the Gujar possess land as well as pastoral ownership. It is however not clear, how they obtained such ownership. It might be due to limited Kohistani population in the past ignoring these areas as less valuable for grazing and cultivation, hence leaving them ownerless. For the first time they were able to purchase lands, in down areas was after merger of State and during Bhutto era. At this stage the grip of landowners loosened and they either sold the occupied land to tenants or at least possessed less power to forcefully remove the occupant and users. Afforestation activities provided the golden opportunity to landowners to vacate the pastoral groups for long term with due institutional support of different donor assisted social forestry projects.

Cattle, sheep, goat flocks use different ecological niches and usually different pastoral regions. Also, the landowners and users in majority of situation utilize different pastoral zones. In some cases, they however, occupy the same pastures but different locations. The cattle herds mostly occupy the valley bottom or other gentle sloping hillside areas. In Mahodand pastures landowner cattle herds, mainly residing in Ushu/ Matiltan area utilize the valley bottom pastural niches. The transhumant mainly goat herders coming from Buner and Sawabi northern hill slopes occupies the pastoral strips on mostly steep hill slopes and narrow side valleys. The terrain of Mahodand valley has limited grazing scope for sheep flocks. Daisan pastures in the south of Utrore, comprising mainly of relatively gentle hill slopes are utilized by landowner Kohistanis of Kalam. This is followed by transhumant cattle herders shifting during winter to irrigated plains of Mardan and Peshawar valleys during winter, sheep dominant semi-nomadic Ajar flock owners and goat dominant semi-nomadic Ajar flock owners respectively. The goat dominant flock owners usually utilize the steep sloping portion of the pasture; while sheep and cattle herder occupies intermediate to gentle sloped areas. Owners and non-owners may occupy the semi permanent colonies in mixed or separate regions depending on topography terrain and accessibility to water sources.

The pastures of Loi Panghalay region are one of the largest hill slope pastoral areas in the region following Daral pastures. During the past five years Loi Panghalay pasture remained closed due to disputes among subsections of Kohistani landowners residing in Utrore. Previous occupation pattern was similar to Daisan pastures. After settlement of dispute among owner groups, the
pasture is mainly leased out to Afghani fat tail shepherders in response to offer of heavy lease amount. However, some native goat and sheep rearing Ajars have also sporadic occupancy. The Shahibagh pastures are similarly owned by Kohistani landowners of Utrore. The lower areas are utilized by Kohistani landowners cattle and goat herds, while the remote upper elevation valley anterior is leased out mainly to semi-nomadic and transhumant goat rearing pastoral groups coming to the region from Buner scrub lands.

Daral pastures though formally claimed by Kohistani landowners of Bahrain are controlled by mainly sheep rearing Ajar pastoral groups occupying during winter, the side valleys on the western side of river Swat including Matta, Kabal, Shamozi and Adinzai areas. These groups regularly occupy Daral pastures during summer, however during recent years the lowland areas traditionally occupied by them have been brought under afforestation and these groups are hence forced to proceed to down areas as for as Attock during winter. Their herd may also carry out orchard under storey grazing in irrigated areas in such regions or may lease a fodder cropped area. Their families however, still reside in Matta, Kabal, Shamozi and Adinzai areas mostly in hillside, where they possess purchased land ownership.

Cattle herder Gujars occupying the valley bottom during summer and shifting to plain irrigated areas of Mardan and Peshawar valleys during winter owns Gabral pastures. The use pattern of pasture was previously such that the main valley bottom was utilized by cattle herder landowner Gujars and the anterior narrow side valley were given on lease to mainly goat and rarely sheep herders Ajars. The landowner Gujars have shifted to commercial crops and even the manure is crop residues are brought from down areas, however the side narrow valleys are still leased out to semi-nomadic goat sheep herders coming mainly from southern hill slopes of Malakand Agency and Buner.

Other pastures like those in Chail, Sakhra, Miandam down up to Dwa Saray region, the mostly absent landlord landowner group has limited dependency on pastures and their main motive remains retention of the pastoral ownership. The owners are relatively more interactive with non-farm occupational sector and market. The pastoral occupation is mainly by transhumant goat, sheep and cattle herders and rarely by semi-nomadic pastoral groups. These are mostly smaller pastoral areas with long term tenancy informal contracts.

Almost all the Kohistani pastorals in the past used to shift to upland pastures during summer almost with their entire families and after return during autumn, they used to collect fodder and fuel for winter scarcity. The only item they required from exterior was the common salt. Different types of grains primarily including barley and wheat were grown at subsistence level. Locally woven woolen clothes were routinely worn and skins were tied around feet, while travelling longer distances. With the growing attachment with the market, they are now more dependent on off-season vegetable production and tourism, with livestock becoming secondary or tertiary level activity. At present, the aged family member mostly carries on the activity, while the younger generation is almost entirely ignorant of the livestock management.

- Qalang pattern and dynamics, and tenant : owner relations

Almost all hillside areas were given on Qalang for grazing during ex-Wali time. The usual practice of Qalang is that one main contractor among Ajarhs (Malak) reaches the pastures before the shifting of animals and negotiates with the representative body of pasture owners on Qalang rate. Bidding is common, hence many Ajarhs have interest in lowland and upland grazing areas. The Malak take possession of the whole area under Qalang and negotiate payment arrangements in installments with the owners. When other Ajarhs arrives to the pasture, he either gives
subcontract to them or distributes the money on per animal basis, excluding the Malak own flock from any grazing costs.

Qalang areas at lowland have been reduced by 31.5% due to active purchase of hillside since the merger of State (1969). These areas are still grazed if under the purchase ownership of Ajarhs or Gujars (cattle herders). Despite continued grazing the hillside contains the highest quantity and diversity of vegetation compared to all other hillside use pattern. If the area is under the purchase ownership of tenants, they usually have protected it from grazing or converted it into rain-fed agricultural terraced fields. In Buner no hillside previously used as winter grazing area has been under the purchased ownership. Plantation activities have further reduced the area given on Qalang. In lower part of Swat 38% of hillside previously used as winter grazing area has been closed for grazing due to afforestation. In Buner the reduction due to afforestation is 28%. In Buner, the community to provide space for natural regeneration on hillside has protected a further 10% winter grazing land used by Ajarhs. At present only 40% of the traditional winter grazing lands are open to Ajarhs in Swat and Buner. The remaining 60% are closed due to plantation, private ownership and protection. The decrease in Swat is 75% and in Buner 38% Due to reduced winter Qalang areas Ajarhs have either left the job reduced their flock size or occupied alternative grazing areas like canal, and roadside grazing (Leede et al., 1997). The newly evolved grazing area in the past 32 years is the increase in orchards under storey grazing that contribute to the feed and are gradually been recognized as complementary activity with more fruit bearing in the subsequent year.

According to Asghar (2001) 50% of the landowners and 90% of the grazers reported worsened relations between transhumant pastoral groups after afforestation in four villages of Khwarzakhella. There has been 51.15%, 27.31% and 60.54% reduction in cattle, buffaloes and sheep/goat population respectively after afforestation. All of the transhumant/nomadic pastoral groups were critically viewing the closure of their traditional grazing land, while all of the landowners were favoring the activity. Many of the landowners afterward, could not managed/cut down/sold out the trees, before reaching harvest stage. All of the landowners residing in these villages were absent landlords of the hillside and were not depending on the hillside for subsistence. Their option to allow afforestation was probably aimed to confirm their ownership over the hillside after the State merger time social anarchy and claim of many occupied lands by the tenants.

Almost all the hillside was given on Qalang till state merger (1969). During 1997, only 9% of hillside were available to the Ajarhs through Qalang in Swat 54% in Buner. At present on average 40% hillside is given on Qalang, which means 60% reduction in Qalang areas in 30 years period. The Gujars and Ajar are the communal tenants mostly utilizing the Shamilat (undistributed communal land), providing agreed upon lease amount to the Tal leader that is in turn distributed among the shareholders. In the past, the Ajar also used to bring occasionally a buck/ram or Woolen shawl/cap for effective Tal members on his own will (Naray). During State times both in Dir and Swat, the Ajar used to provide nominal Qalang to landowners and the landowner gave much importance to manure. Many of the big landowners used to provide free accommodations and stubbling to the transhumant Gujars just for the sake of extra manure meaning extra land fertility and grains. It was after the advent of chemical fertilizers, when this mutually inter-dependant relationship was weakened. Afterward the exploitative role of landowners become dominant and the process of political polarization among both the social groups initiated. The first sign was the gradual increase in lease money, and disinclination of the Ajar to bring Naray, abolishment of the forced labor (Bigaar) by the Wali and subsequent Pakistan government. Claiming of the land by some tenant followed this and disputes over ownership initiated. Finally, the landowners marginalize the Ajar through distribution of communal land, land sale to tenants
and afforestation with due institutional support. According to Leede et al., (1998) during the past 30 year the increase in Qalang rates during the last 30 years varied from 100% to 1000% in different regions. The increase was higher in Buner than Swat.

During the last 4-5 years the Qalang rates at low lands has been stabilized however there has been substantial increase in the Qalang rate of upland pastures along with additionally imposed passage fee. In Mahodand pastures as reported by the pastoral groups, they are now been taxed by the local pastoral owner tribes at the rate of 10,000/- to 20,000/- rupees depending on the herd-size as a passage fee through their territory. This transaction tax is collected in addition to pasture lease money. Those passing through the valley to Laspur pastures of Chitral are particularly heavily taxed.

2. Chitral upland pastoral systems:

- General Farming Systems and trends

The farming system in Chitral is not as complex as in Swat and Dir region. The following are the determinant factors of Chitral farming system.

1. Being an arid region rain-fed cropping is almost non-existent in Chitral.
2. Difficult terrain of the valley limits possibility for irrigated agriculture to less than 1% of the land area.
3. Population is sporadically segregated around the areas with cropping potential.
4. The prolonged winter in the region mostly allows for mono cropping.
5. The region remains cut-off from the remaining country for 4-5 months during winter due to Lawari Pass blockade during winter.
6. Due to remoteness and difficult access, the region has limited association with the markets of down country and the production is mostly for subsistence level.
7. The limited occurrence of hailstorm causes orchards to bear more fruits and different orchard varieties are commonly grown and dried for limited out marketing.

Most of the daily inputs like sugar, salt, wheat flour, vegetable ghee, milk packets and rice etc are shifted from down the country. During the past, almost all the population was semi-transhumant in nature mainly depending on pasturing of goat, sheep and cattle. However now a major proportion of the growing population depends on subsistence level farming and pasturing has gradually shifted to new evolving earning professions particularly in small towns in the main valley like Chitral, Drosh, Ayun, Boni and Mastuj. With population growth and the limited cultivable land resources, the youth is compelled to proceed to mega-cities down the country for remittances earning. On geographical basis, three main farming systems can be identified in the region. Different farming systems are evolutionary adaptation to provision of occupied ecological niche.

1. Main valley irrigated farming system has rice plus wheat/legume fodder alternation-cropping pattern on the riverbank. The land near settlements, inside house compound and near the torrent streams has orchards. The bank of torrent stream, where frequent flooding is common is used for cattle foraging. Most of the households have 1-2 cows and tractors gradually replace the tradition of keeping pair of oxen for plough. The frequency of keeping 1-2 cows has gradually reduced and replaced through use of packed milk. The dependency on chemical fertilizers is increasing and tradition of keeping livestock for manure purpose is diminishing. Non-farm earning activities are becoming the primary occupation and farming a becoming a
secondary or even tertiary level occupation. With increasing elevation and subsequent winter prolongation the significance of hay and fodder tree leaves increases in the feeding schedule due to prolonged winter and little availability of crop residues. Orchards under storey grazing also contribute to the feed and are now recognized as complementary activity with more fruit bearing in the subsequent year. Classical landlords and tenants are non-existing or have limited impact. The landholdings are particularly small and can rarely suffice a family subsistence.

2. **Semi-transhumant system prevalent inside narrow valleys** is characterized by mono-seasonal cropping, either of maize or fodder or vegetable rotation. The dependence on livestock is more but decreasing and different environmental niches are simultaneously utilized during short summer duration. Livestock and part of family proceed to the nearby upland pasture for summer grazing, while fresh *Quercus incana* tree leaves and hay/dried tree leaves are fed during winter. Some of the steep slopes are covered with patches of oak (*Quercus* sp.) and blue pine (*Pinus wallichiana*) forest. The protected pastures are situated in/near the arable lands at the valley bottom and are harvested for hay in September. In winter livestock depends on intensive stall-feeding. Different ecological niches have a characteristic herd/flock composition. Hence in western part (Lotkoh region sheep and goat both are included along with cattle in subsistence livestock herd. In southeastern and central part (Shishikoh, Arandu, Drosh, Ayun, and Chitral) goat and cattle mixed herds are common, while in northern (Baroghal) yak remain the principal domesticated breed along with goat and cattle. Among the local residents, the early settlers are called *Miraskhor* and the late settlers are called *Dastoorkhor*. *Miraskhor* have exclusive ownership rights. Under strategic pastoral occupation pattern, when a pasture condition deteriorates, it is either completely banned for pasturing (both *Dastoorkhor* and *Miraskhor*) called Amm Saag, or partially banned for *Dastoorkhor* called Khas Saag. In some situation a particular livestock specie (whether belonging to *Dastoorkhor* or *Miraskhor*) is prohibited called Purktick.

3. **The Transhumant/semi-nomadic system** is the main livestock production system. The population of sheep and meat type goat is principally limited to transhumant herders, and they are solely dependent on grazing and browsing on hillside except in winter, when tree leaves are fed during rainy days, and where no grazing and browsing is possible. The nomadic shepherds used to move between summer upland pasture in Kailash, Goleen, Laspur, Tirich and Madaklasht valleys, and low land winter ranges in Arando, Drosh, Shishikoh, Brooze and Ayun valleys in lower Chitral. The Mehtar-I-Chitral family also owns some of the upland pastures, commonly leased to non-owner transhumant herders. The transhumant herders spend 4-5 months during summer at upland pastures (on lease basis). The limited feed availability at low land winter range is the limiting factor to their flock size. The observed trends are that the availability of upland pastoral areas are decreasing rapidly in area due to political and institutional reasons and increasing population of the narrow side valleys.

There are clear zones of crop systems with respect to altitude, slope and aspect, water availability and soil conditions, while fertility is mainly maintained with manure and casual chemical fertilization. Different ecological zones are inter-linked, constituting a multi-community subsistence unit. The internal transactions in such a unit are regulated by both barter and monetary system. The common characteristics of the traditionally internalized system was the use of local resources in such a way as to support the internal consumption of the rural community as well as for exchange, along with maintaining the productive capacity of the resource base. The semi-transhumant farming community also remains involved in food processing (*yogurt, whey, cheese* and *ghee* etc) for subsistence or exchange purposes with the other zones mainly producing grains. In some regions with special wool availability, like Garam Chashma the woolen handicrafts and woolen clothes are primary exchange items not only at regional level but also
shifted to down country markets. The evolving system is the market oriented externalized system based on production for the market and obtaining all the inputs from it. The economic base is shifting to remittances and at present almost every household contain a migrated remittances earner. The phenomenon of migration is complex and based on accessibility and migration costs. The marginal social segments used to migrate to local towns. The relatively well off are migrating to mega-cities like Peshawar and Karachi. The household with more male children is considered advantageous in terms of more future labor for remittances earning.

- **Pastoral Sub-systems**

Different pastoral sub-system identified include:

1. **Arkari goat grazing transhumant pastoral subsystem.** Steep sloping hillside with sporadic pasture stripes and narrow glaciated bottom valley characterize the subsystem. The valley bottom is grazed by semi-transhumant owner users mostly cattle or mixed herds, while the steep sloped pasture stripes are leased by transhumant goat herders. The Mahodand pastures are mostly under the communal ownership of Ushu/Matiltan Kohistani’s, while some pastoral areas are under the purchased ownership of Kohistani’s belonging to Kalam. The Mankial pastures are mostly under the communal ownership of resident Gujars and Kohistani’s. They utilize the valley bottom for their cattle/goat herds, while transhumant goat herders for summer grazing lease the remote sloping areas. The Bishigram pastures are under the communal ownership of Toorwali Kohistani’s residing in the area. The valley bottom is used for subsistence maize/hay harvest, while the steeper down valley side areas are used for cattle grazing by settled owner users. Transhumant goat herders for summer grazing lease the remote upland areas.

2. **Begusht sheep/goat grazing pastoral subsystem.** Steep sloping hillside with sporadic pasture stripes and narrow glaciated bottom valley characterize the subsystem. In the Shahi bagh to the valley bottom and gentle hill slopes off-season vegetable production is extending, and the steep slopes and marshy valley bottom is used for goat and cattle grazing by Kohistani semi-transhumant owner users belonging to Utrore village. The anterior high elevation steep sloped pasture stripes are leased by nomadic and transhumant goat or goat/sheep mixed flocks owners. Transhumant/nomadic goat flocks for summer grazing exclusively lease the Kundal lake pastures. The Kundal lake pastures are under the communal ownership of Kohistani’s belonging to Utrore. The Gabral area steep slopes pastures are owned by Gujars residing in Gabral valley. The owner Gujars goat/cattle flocks and nomadic/transhumant goat or goat/sheep mixed flocks jointly uses these pastures for summer grazing. The Mankial valley upland steep pasture-stripes communally owned by sedentary Gujars, residing in the valley bottom are leased mainly by nomadic/transhumant goat flocks owners for summer grazing.

3. **Goleen and Laspur goat/sheep transhumant and owner user pastoral subsystem.** Gentle sloping hillside pastoral areas characterize this subsystem. Different livestock occupies different ecological niches. The goat flocks occupy the high elevation steeper areas. The sheep flocks occupy the gentle sloped niches with limited grazing potential, while cattle occupy the gentle areas with highest grazing potentials. The cattle mostly belong to the semi-transhumant owner users, while sheep and goat flocks mostly belong to nomadic or transhumant pastoralists shifting during winter to Southern part of Malakand Agency during winter. The Loi Panghalay belongs to the Kohistani’s of Utrore under communal ownership, while Daisan belongs to the Kohistani’s of Kalam under communal ownership. Due to repeated closure of both the pastures due to disputes on distribution of lease money, only nomadic pastoral groups both local and Afghan visit the areas with their flocks during summer.
4. Madaklasht transhumant/owner users pastoral subsystem. Daral pastures traditionally belong to the Toorwali Kohistani, s of Behrain. However, due to limited direct utility the transhumant shepherders occupying the region during summer with out leasing. Furthermore, the landowners are more dependent on tourism since ex-state times, hence never inclined to forcefully confirm their ownership over Daral pastoral area. Saidgai pastures are attached to Daral pastures but lying in the territorial limits of Dir district. The status of ownership and use pattern is similar to Daral pastures. Sheep flocks predominantly use both these pastures. Kumrat pastures belongs to the sedentary Kohistani’s residing in Thal/Lamotai area of Dir Kohistan. The transhumant/nomadic sheep and goat flock owners lease the pastoral area for summer grazing and strategically occupy different ecological niches for grazing of different livestock species. The sedentary pasture owner Kohistani also sends their non-lactating herd-members for grazing to Kumrat pastures.

5. Baroghal Yak, sheep and goat grazing subsystem. The local sedentary landowners principally depend on Yak for their subsistence. Yaks are adapted to cooler areas and are able to scavenge their feed under snow cover in the farm of dried grasses and shrubs. Yak, sheep and goat form part of common herds.

6. Lawari cattle and goat grazing subsystem. The transhumant cattle herder Gujars owns the region. They used to shift during winter to irrigated sugar cane producing area of Peshawar plains. The wider valley bottom and surrounding arable gentle to steep slopes are rapidly transforming into potato producing fields and the livestock based subsistence is rapidly changing to cash crop base. The changing land use has enormous environmental implications.

7. Kailash transhumant/owner users cattle and goat grazing sub-system. Semi-transhumant owner users exclusively use these subsystems and they sporadically allow the nomadic flock owners to lease some pastoral stripes in the region.

Out of the 7 sub-system, three are selected for detailed evaluation. These include Kailash pastures, Arkari pastures and Goleen pasture subsystems.

- Pastoral groups and pasture ownership pattern

Different pastoral groups visiting the pastoral areas include different groups of local landowners mostly with mixed livestock population. Transhumant cattle/goat herders called Gujars and Afghani fat tail sheep (Balkhi) herders belonging to Badakhshan area in Afghanistan. The landowners Chitralis are mostly local communal land owners or ex-ruler family (Mehtar-I-Chitral). The native population of Kailash has been reduced to the small valleys of Bamburait, Rambur and Bereer (Kafiristan). While the different Afghan tribes have differentially occupied different valleys through the gradual infiltration. It is unclear, however, that how a dominantly common language was evolved. Though in some regions, for example Kafiristan and Madaklasht valleys Kailashwar and Persian languages are spoken. The major proportion of Chitrali people belongs to Shafnai tribe (belonging to Shafnan in Afghanistan), residing in majority in Chitral tehsil, and Koghozi. This is followed by Azakhel (belonging to Delhi in India) and Dashmanin (Religious class) tribes. Katourai (claiming to have Mughul origin, originating from Delhi, The Mehtar family) is the smallest but the most powerful tribe. Alghani (name given to Pushtu speaking tribes mainly belonging to Kunarh, Dir and Bajour) population has increased by many folds during the last 40 years and is presently dominating the larger towns like Drosh and Chitral. Beshqari (belonging to Swat and Dir Kohistan) is another small tribe residing in Shishikoh, Koghozi and Goleen areas.

It is also not clear that when the Gujri speaking Gujar population came into the area and started local level transhumance. They however know their association with the extended Gujar subsections like Katan Khel and Choan Khel etc., also available in Dir, Swat, Buner, and entire
Hazara, and even among the landlord of Central Punjab (known as Katana and Chohan). The degree of extended spread out of the sub-tribes reveal there quite recent gradual sedentary occupations in Punjab and parts of Hazara. These have also been traced out in East Punjab, where they probably practiced transhumance and nomadism toward Kashmir. In parts of Kashmir, they are among the politically powerful landowner groups. In Malakand region Gujar claims to have more than 180 thousands small and large families according to their genealogy (approximately 25% of the total population).

Different pastoral groups have variable access rights, different pastoral occupation and herd composition patterns and variable dependency on pastures. These groups variably make ad-hoc or long-term tenure agreements driven by the monetary benefits to be accrued by those with established ownership rights over pastoral areas. Those with established ownership rights are the earlier settlers and are locally known as Miraskhor. The late settlers have limited pasturing rights and these are locally known as Dasturkhor. Sometimes a particular pastoral niche is closed to all to facilitate regeneration and the process is known as Am Sag. In other situations to reduce stocking over a pastoral area only the livestock of Dastoorkhor are prevented from grazing and the phenomenon is called Khas Sag. In Kailash valley although the pastoral ownership was with the local Kailashi people, however in 70% situations they have sold the lands as well as pastures to earlier immigrants from Afghanistan called Shaikhan and to those coming from Ayun and other parts of Chitral. In Arkari valley, the landowners (practicing Ismaili sub-section of Islam) are previous immigrants from Badakhshan in Afghanistan. A portion of the landowner group in Golen valley has immigrants from the bordering Bishqar region (Swat Kohistan) and the Central and Southern Chitral landowners claims to have migrated from central Afghanistan. In the main valley emerging towns (Drosh, Ayun, Chitral, Boni, Garam Chashma) the landowner groups originally depending on pastoralism have gradually shifted to non-farm occupations mostly in the service, trade sector cash cropping and tourism. With the extending market, their main stay on livestock has gradually shifted and they generally became lesser and lesser dependants on pastures. On the other hand those occupying the side valleys have moved to the anterior of side valleys, mostly the areas traditionally used as upland pastures.

In almost all valley the Mehtar family has some pastoral ownership. Such ownership has reportedly been developed by different means, including reception as gift or as a reward for dispute settlement among the locals. Since the State consolidation during the end of nineteenth century, the Mehtar started reception of Qalang from the nomadic or transhumant herders visiting the upland pastures only nominally mainly in kind (milk or wool products) as a sign of authority over the territory. Most of such pastures are still given to transhumant or nomadic herders on Qalang. It seems that during ex-state time for most of the pastures, the Mehtar received the Qalang from the nomadic/transhumant Gujar and Mehtar used to occupy even the cultivated lands. All the lands including cultivated lands were supposed to belong to Mehtar and the land occupation commonly shifted to those favoring Mehtar. It was during Bhutto time when those residing near the pastures occupied the pastoral areas and started claiming its ownership. Only pastures, where the Mehtar family could retain ownership, were those where the transhumant Gujar were with strong footing. The new landowners practicing semi-transhumance gradually extended their ownership and gradually marginalize the transhumant/nomadic Gujar. The local people extended their settlement and ownership mainly after weakening of the State and its merger into Pakistan. Many disputes have been erupted on the right of use particularly with the transhumant non-owner Gujar during the last few years.

Many nomadic and transhumant goat herders (Ajars) from southern part of Buner visit the Laspur and Madaklasht pastures through Mahodand valley. Those visiting from Buner never bring their female family members and children, while visiting these pastures. The locally residing Gujar
however shift to upland pastures with part of their families. During winter the transhumant non-owner Gujars shift to Ayun, Brooze, Shishikoh, Drosh and Arandu region, where they mostly depend during winter mainly on *Artemisia maritima* grazing and *Quercus incana* browsing. Despite close ethnic relationship, the Gujars residing in Chitral and those residing or coming from outside have at present limited social association if any. The Afghani sheepherders also visit the Begusht pastures near Garam Chashma during summer and occupy the many pastures available on the Pakistani side of the boundary, hence in some region well-defined boundary is non-existent or never traditionally cared for. The intensity of their visits to the pastures inside Chitral increased after soviet occupation till Taliban times, where after it gradually reduced. The transhumant and semi-transhumant goat herders both among owner and non-owner groups are the dominant pastoral users in Chitral valley.

- **Pastoral occupation pattern**

The mobile pastoral systems are practiced in the region since long, and dependence on livestock remained enormous to insure quality nutrition in a region having limited scope for crop production. In the past livestock provided even the entire clothing and facilitated long/short distance load carry. Now the increasing population is basing itself mainly on remittances, cropping and other off-farm employment. The long distance load carry is facilitated through vehicles, while cloth made in cloth mill down the country is used. The propagation of chemical fertilizer further reduced the dependence on livestock for manure, which previously was its principal utility. The Kailash people that probably resided the region till early Mughal period practiced transhumance as they do it today. The Kailash traditions say that they are the descendents of Greek invaders to the region some 600 years before Christ. They gradually developed a resource use pattern well to available opportunities. For example their diet, festivals, customs and wearing all included extended use of livestock and livestock products.

The valley bottom of the southern half of Chitral possesses the potentials for winter grazing. The transhumant and nomadic goat herders hence shift with their flocks to these areas during winter. In the narrow side valleys in particular, the evergreen *Quercus incana* leaves are the major contributors to wintering livestock ration. In Northern and Western Chitral the upland pastures in Goleen, Laspur, Shishikoh and Shandur are the principal pasture used by nomadic/transhumant herders. The Gujars nomadism/transhumance probably extended to Chitral after the Swat State consolidation during first quarter of the last century. Earlier the prevailing insecurity prevented the extension of the long-range transhumance/nomadism through Mahodand valley in Swat Kohistan that had close cultural and political relationship with Chitral. The gradual shift of some of the nomads to spend winter in Chitral was a subsequent development.

The decline of Kailash authority and invasion of settlers from other region led to occupation of Kailashi settlements in the main valley. Places like Drosh, Ayun, Chitral, Koghozi, Booni, Mastuj, Shoghore and Garam Chashma were the earlier occupied settlement. Such settlement probably led to the gradual adoption of Kailash semi-transhumant system by the new settlers with necessary customary modification. The immigrants from the neighboring region never needed such adaptation, hence were the earlier semi-transhumant pastoralists among the new settlers. In Garam Chashma and Arkari the main immigrants were from the neighboring Badakhshan region in Afghanistan with nearly similar climate, hence more extensive pastoralists even today. The settlers with cultured and agrarian background, like Kotoray people, promoted the orchard production in the main valley like Drosh, Ayun, Chitral and Booni areas.

Different sub-regions in Chitral have variable pastoral occupation patterns. In Bamborait valley in Kailash area the Shoul is one of the main pastoral area. The pasture accommodates 1500 goat,
350 cattle, 100 donkeys and 23 horses for four months during summer from Shaikhanandeh village in the valley. The Shaikhs residing in the village are Muslim immigrants. The people of Sahan settlement in Ayun town have purchased another pasture named Outak and bring some 400 goat to the area, while transhumant Gujars bring 1000 goat to the pasture. The people of Karakal, Bomborait Pain, Ahmadabad and Wadus occupy Bagharit pastures, accommodating some 1200 goat, 300 cattle and 70 donkeys for four months during summer. The Astoi and Zainur pastures are smaller pastures each accommodating 500 goat and 70 cattle from Batrik, Kandisar and limited flocks from Anaish villages in Bomborait valley. The Achilgah pasture accommodates approximately 900 goat, 200 cattle and 50 donkeys of Palolande village and major portion of Anaish village. Some 20 Gujars have purchased a portion of Acholgah pasture from Kailashi people and practice transhumance between Ayun and Acholgah pastures. Among the Gujars and Kailash there are pastorals who bring the livestock of 4-5 families with smaller herd to the pastures previously in return for butter oil and cheese and now in return for per animal money and clothes. The pastoral occupation is generally stepwise and depends upon the topography of the pastoral area. In some areas, two months are spent at the vertical limit, while one month before access and after return at an intermediary grazing location, while in some other three months can be spent at high altitudes. In many locations, the previous most productive pastures have been converted to croplands during the last 30-40 years.

In Arkari Anjasay are the dominant social group followed by the Syed and Dashmanay (religious class) social groups. Chowkaia is another social group occupying the area. Anjasay were the Charvallow (those responsible for imposing the Mehter decisions) for the Arkari region. Megigrangol pastures are owned by Mehter family and are leased by the transhumant goat herder Gujars from Drosh area. While the Agramgol, Khoeengol and Kurhombokhtgol pastures are commonly owned and utilized by the residents of Arkari. Besti was a pastoral area about 40 year’s back, subsequently crop cultivation started with seasonal residence that was followed by permanent residence in Besti. Besti has two sub-sections i.e., Besti Bala having 44 households migrated from Siah Arkari and Besti Pain having 67 households migrated from Safed Arkari. The Residents of Besti Bala utilizes Khoeengol pastures during summer and the residents of Besti Pain utilize the Kurhombokhtgol pastures. The kids and calves are grazed by the children at the gentle sloped valley bottom, while the adult cattle and sheep the less gentle, while goat utilize the relatively steeper hill slopes. There is three-stage pastoral occupation i.e., initially area “A” is occupied during early summer (1 month), followed by upward movement to area “B” during mid summer (2 months) returning to area “C” (adjacent to area “A”) during autumn (1.5 months). There is a gradual extension of cropping over prime pastoral areas in the valley bottom. There is extensive sowing of Medicago (Rishqa) that serve as the main perennial fodder crop continuously producing for more than 20 years. The Rishqa is harvested and stored as hay for feeding the wintering goat and cattle. Oak, Willow, Birch and Poplar tree leaves and seabuck thorn shrub are the main feed resources during fall. Tree leaves are also dried for feeding with hay during winter. Oak, tree leaves are the only available green foliage during winter. The leaves of orchard like apple, mulberry, walnut etc., are plucked after plucking the fruit and stored for feeding wintering livestock. The leaves of Poplar and Willow are similarly plucked and stored for feeding wintering livestock. Dried potato leaves serve as a feed resource for wintering livestock. The dried tree leaves are mixed with wheat straw to feed the plough bulls and dry cattle, while Rishqa mixed with wheat straw is given to lactating cows during winter. During plough season the ration provided to bulls become double, while to the lactating cow and goat also good ration is provided. To make rams healthy for slaughter on Jishni-Naorozi (21 March), they are also provided with good ration. Giving good ration means these animals are allowed to enter the main ration store well before the other animal and allowed to consume, what they want. The remaining animals are allowed in the ration storehouse for limited time.
In Goleen Mosingay tribe has been reported to replace the native Kailash population some 500 hundred years back. Madak people from Madaklasht and Beshqari people from Swat Kohistan subsequently joined them. In later stages some families of Dashmanay (religious class) social group also came to the valley. These social groups extended their occupation from Koghozi to the Goleen valley. According to the locals, Gujars used to visit the pastures before their occupation of the valley. The shifting of permanent settlement to Goleen valley from Koghozi was probably during the second quarter of the last century. Koroiboh, Chatuduk, Bakhturan, Koroi, Shahchikoh, Boijal and Shaigh pastoral areas are still owned by Mehtar family and were leased to Gujars from Baroz and Shishikoh valley till last year. During year 2002 the sedentary occupants of Goleen valley through the efforts of IUCN and Mountain Area Conservation Project united against the nomadic/transhumant Gujars and resisted their occupation of the upland pastures. The transhumant Gujars in return have filed a civil suite in the court of District and Session Judge Chitral to protect their livelihood. The case is under trial and the court has directed that if the transhumant are not allowed, the locals should also refrain from pasturing their livestock in the pastures under dispute till settlement of the issue. At present, the dependence of sedentary occupants of the valley is minimal as majority of them is depending on non-farm occupations. While few among the sedentary residents used to visit the pastoral areas of Khoeendargol, Bowijal, Ouch, Loochak, Chatralogh and Shama ghjal sub-pastures. All these sub-pastures are situated inside Rogheeligol pastoral area. Valley bottom of Rogheeligol has been converted into protected pastoral areas, from where forage is harvested and stored as hay for winter feeding of the sedentary occupants livestock. During summer when the non-lactating herd members are shifted to pastures, the kids and calves are grazed by the children at the relatively gentle hill slopes and valley bottom, while for the adult cattle, sheep and goat the steeper pastoral regions are used. There is limited sowing of Medicago (Rishqa) in the vicinity of the household that serve as supplemental hay for the lactating herd members. Oak, Willow, Birch and Poplar tree leaves and Seabuck thorn shrubs are the main feed resources during fall. Tree leaves are also dried for feeding with hay during winter. Oak, tree leaves are the only available green foliage during winter. The leaves of orchard are plucked after harvesting the fruit and stored for feeding wintering livestock. The leaves of Poplar and Willow are similarly plucked and stored for feeding wintering livestock. Dried potato leaves are serves as a feed resource for wintering livestock. The dried tree leaves are mixed with wheat straw to feed the plough bulls and dry cattle. During plough season the ration provided to bulls become double, while to the lactating cow and goat also good ration is provided.

Cattle, sheep, goat flocks use different ecological niches and usually different pastoral regions. Cattle are more common in the goat dominant herds of semi-transhumant, while the nomads/transhumant have mostly absolute goat flocks. Sheep flocks are more common in Garam Chashma pasture mainly due to terrain suitability. Also, the landowners and users in majority of situation utilize different pastoral zones. In some cases, they however, occupy the same pastures but different locations. The cattle herds mostly occupy the valley bottom or other gentle sloping hillside areas. The goat dominant flocks usually utilize the steep sloping portion of the pasture, while sheep and cattle herder occupies intermediate to gentle sloped areas. Owners and non-owners may occupy the semi permanent colonies in mixed or separate regions depending on topography terrain and accessibility to water sources.

- Qalang pattern and dynamics, and tenant : owner relations

Generally, the communities themselves use the pasture areas controlled by the local communities. The pasture possessed by Mehtar families in general are leased to the transhumant/nomadic pastoral groups. The lease amount is collected on annual basis from the visiting pastoral groups
on annual basis through a representative of the Mehtar family. The amount of lease depends on the size of pastoral area and those traditionally using the area experience limited annual increase in lease amount. The Mehtar family remains much interested in maintaining their ownership over pastoral area rather than the lease amount.

The Mehtar family maintain normal relations with the leasing parties, however the relation between the remaining landowner group particularly those depending on pasturing themselves have much strained relationship with the migratory pastoral groups. Many disputes over the access rights are in courts among landowner and non-owner user groups. Disputes among different settler groups on pastoral area ownership are common in the southern part of Chitral particularly in Shishikoh valley. With increasing population, the access to pasture is becoming particularly important for survival.

3. Chorh (Alai) pastures

- General Farming Systems and trends

Chorh pastures lies just to the north of Mansehra, west of Kaghan valley and east of Batagram and Alai. The pastures is surrounded and accessed through the high elevation passes, however the water shed is emptied in the river Indus through Palas valley in Kohistan district. Despite availability of different types of mobility patterns, the ownership of the major proportion of the Chorh pastures is with the people of Alai. The Kohistani possesses a minor portion and they are in dispute with the people of Alai over the Chorh pastures ownership primarily on the basis of watershed function. The following are the determinant factors of the farming system in and around the Chorh pasture.

1. Being a dominantly sub-humid region rain-fed cropping is the dominant farming system in Alai, Batagram and parts of Mansehra annexed to Chorh pastures. Toward Palas valley in Kohistan however, gradual shift toward semi-arid conditions is observed.
2. Where irrigation is possible particularly in the valley bottom rice cultivation is dominant, while on hill slopes maize production on mono-seasonal and maize plus wheat in by seasonal areas is common
3. Population is generally scattered on the hill sloped with social segregation at different ecological niches.
4. The prolonged winter in the region mostly allows for mono cropping.
5. Due to remoteness and difficult access, the region has limited association with the markets of down country and the production is mostly for subsistence level. Around Mansehra proper commercial scale, vegetable production is common with limited influence on the annexed areas of Chorh pastures.
6. The orchard production is limited to domestic consumption with limited orchard production on commercial scale. Hailstorms are also common in the region.

Most of the daily inputs like sugar, salt and clothes etc. are shifted from down the country. In staple production, the area is predominantly self-sufficient. During the past, almost all the population was semi-transhumant in nature mainly depending on pasturing of cattle, goat, sheep and buffaloes. However now the gradual shift to non-farm occupations is leading to variation in semi-transhumance. The landowners have decreased the activity, while mostly the non-owner cattle and Buffalo herder are still attached to the activity. In general a sizable proportion of the population is still depending on subsistence level farming and pasturing has gradually shifted to new evolving earning professions particularly in emerging towns like Karg, Bisham, Batagram
and Mansehra. With population growth and the limited cultivable land resources, the youth is compelled to proceed to mega-cities down the country for remittances earning. On geographical basis, five main farming systems can be identified in the region. Different farming systems are evolutionary adaptation to provision of occupied ecological niche.

1. Main valley irrigated farming system surrounding Alai stream and Batagram proper has rice plus wheat/legume fodder alternation-cropping pattern. Such fertile areas are mostly occupied by the land owners powerful groups with relatively dense settlements. The livestock is subsistence level and crop residue based and the herd size may vary between 2-10 animals mainly buffaloes. On the adjacent hill slopes maize cultivation is dominant and alternated with wheat cultivation in low altitude areas. The hill slopes with mainly rain-fed farming are leased to tenants mostly on share cropping basis. With increasing altitude, the cropping becomes mono-seasonal and maize is the sole crop. The significance of hay and fodder tree leaves increases in the feeding schedule due to prolonged winter and little availability of crop residues at high altitudes.

2. Maize and wheat cropping characterize the rain-fed subsistence tenant system on the gentle to steep hill slopes. The tenant occupy the areas with more cultivable areas, while the Gujars occupy the areas with more grazing area. The tenant/landowner relationships are still partially on sharecropping and partially on cash basis. Among the tenants, female members of the family are mostly involved in farming activities, while most of the male do the non-farm wage labor activity or collecting fuel-wood for sale in the nearby villages and small towns. Livestock is the most important risk avoidance mechanism under the variable rainfall. When the crop fails to bear grains, it is harvested for livestock feeding and increased subsequent livestock number avoids the risk. Beef cattle are the main component of the herd. Crop residues (maize stalks and wheat straw) and concentrates characterize the feeding system. During good rainfall hillside grazing significantly, contribute to livestock feeding. Lactating goats are more numerous, consume the tree leaves, and do browsing the nearby hillside. Stubble is carried out for longer duration than the irrigated system, as the farmers have to wait for rainfall before re-sowing. The gradual increase in population is making the rapidly fragmenting the locally available land resources not able to sustain a family unit.

3. The gentle slope terraced mixed farming system is relatively complex and is the main characteristic farming system of almost all the narrow side valleys. It is characterized by more dependence on livestock than crops. In general, cropping tends to be concentrated on gentle, less erosive slopes with deeper inherently fertile soils, having tendency for moisture retention. On the other hand, rangelands mainly have highly erosive, shallow, badly gullied, stony and poorly drained infertile soils. Thus in a single locality, the croplands may be intermingled with less favorable grazing lands. Agricultural production is much less due to limited arable lands and less irrigation possibilities. Rice is cultivated at the valley bottom on streamside terraces and alternated with wheat, while at the rain-fed or spring irrigated hillside gentle slope maize and wheat is alternated. The valley bottom has two crop wheat and maize/rice per year, while the upper hill slope and shaded areas do have a single maize crop. The landowners keep mostly stall-fed buffaloes for subsistence through crop residues or hay collected from cropland boundaries. They occupy the most fertile foothills/valleys. The less fertile agricultural soils are leased to or owned by tenants. The farmers send their animals for grazing to the hillsides rangelands during spring and summer. The fodder shortage for winter is met by hiring paid labor from down stream areas to help the family labor during hay harvesting seasons from the protected hillside during September. *Mulberry* and *Celtis* leaves are used in addition during the summer scarcity period (in the hotter areas).
4. The least fertile lands with only grazing and browsing potentials are occupied by *Gujars*. The *Gujars* keep buffalo, cows and goats and depend mostly upon livestock production. The *Gujars* livestock depends more on grazing followed by browsing, hay making and lopping. The *Gujars* residing in Alai region mainly subsist on cattle and buffaloes. Livestock and part of family proceed to the nearby upland pasture for summer grazing, while crop residues, fresh *Quercus incana* tree leaves and hay/dried tree leaves are fed during winter in the high elevation areas. While residing in low elevation areas the use of crop residues and hillside grazing become the dominant option in winter feeding strategies. The steep slopes at middle to high altitudes are mostly covered with patches of oak (*Quercus* sp.) and blue pine (*Pinus wallichiana*) forest. At winter areas the *Gujars* have dominant purchased ownership and the dependence on livestock is gradually replaced with non-farm occupation dominantly wage labor down the country.

5. The Transhumant/semi-nomadic system is the main commercial traditional production system. The population of sheep and meat type goat is principally limited to transhumant herders, and they are solely dependent on grazing and browsing on hillside except in winter, when tree leaves are fed during rainy days, and where no grazing and browsing is possible. Few Nomad/transhumant with cattle spend the winter in downhill, irrigated plains, feeding mostly crop residues particularly sugar cane tops in return for their sugar cane harvesting labor, have lower dependency on range lands. The nomadic shepherds used to move between Chorh upland alpine pasture, and low land winter ranges in Kaladakh, Batagram, Buner, Sawabi, Haripur, and rarely Fateh Jang, Atock and Taxilla. The landowners or state lease the faraway low elevation hill slopes to nomads for 5-6 month during winter. They spend 4-5 months during summer at upland pastures (also on lease basis). The limited feed availability at low land winter range is the limiting factor to their flock size.

There are clear zones of crop systems with respect to altitude, slope and aspect, water availability and soil conditions, while fertility is mainly maintained with manure and casual chemical fertilization. Different ecological zones are inter-linked, constituting a multi-community subsistence unit. The internal transactions in such a unit are regulated by both barter and monetary system. The common characteristics of the traditionally internalized system is the use of local resources in such a way as to support the internal consumption of the rural community as well as for exchange, along with maintaining the productive capacity of the resource base. Production was mainly aimed for subsistence at household or community level. Peasant household also remains involved in food processing (*yogurt, whey* and *ghee* etc) for subsistence or exchange purposes with the other zones mainly producing grains. The economic base is shifting to remittances and at present almost every household contain a migrated remittances earner. The phenomenon of migration is complex and based on accessibility and migration costs. The marginal social segments used to migrate to local towns and cities for labor. The well-off residents are migrating to Middle East Asia. The farming is gradually becoming of secondary importance for the landowners and land is considered as a salable asset. There is tremendous land ownership transformation toward the purchaser tenants and *Gujars* particularly the rain-fed hillside and sloping lands. The plain irrigated fertile areas are gradually being covered with concrete building constructed mainly through remittance money and a household with more children is considered advantageous in terms of more future labor for remittances earning. This result in remittances based population explosion at a comparatively faster rate.

- **Pastoral Sub-systems**

Different pastoral sub-system depending on the Chorh pasture include:
1. **Cattle and Buffaloes grazing transhumant pastoral subsystem.** Main Chorh valley bottom upward Laraykas and Kozpatti and predominantly gentle sloped downward pastures characterize this subsystem. The main utilizing livestock is Cattle and Buffaloes. During the past, landowners residing in Alai practiced transhumance comparable to the Gujar. However at present the landowner semi-transhumance is limited to the pastoral region before crossing the Ajrhi Kandaw to Chorh pastures. Not only the transhumant and semi-transhumant Gujars residing in Alai during winter bring their cattle and buffaloes to Chorh for pasturing during summer. The Gujars from Chatarplain and Battal in Mansehra also visit the Chorh pastures mainly through Chorkoh Kandaw, Ramgali Kandaw and Kaigali Kandaw. Transhumant and semi-transhumant Gujars traditionally utilize both sides of the Chorh stream at the bottom of the Chorh valley.

2. **Goat grazing nomadic/transhumant pastoral subsystem.** The steep terrain mostly high altitude annexed to the main valley pastoral settlements in Chorh valley characterizes this subsystem. The main utilizing livestock specie is goat. The Ajarh migrating along families however keep their families in the key settlement. However when only male migrate, they stay with their flocks at upper elevation mostly in caves or any other natural shelter. Both have advantages and disadvantages. When with family, he is more secure but he and his herd have to travel long distances or the flock remains at a relatively high risk from wild carnivores, if left unattended during night. With the second option, he himself remains at risk from all types of natural disaster and he has to stay with least utilities. However the risk of carnivores minimizes and limited travelling time for him and the flock. Transhumant and nomadic goat herders equally utilize both the options.

3. **Afghani fat-tail sheep nomadic pastoral subsystem.** Afghani fat tail sheep, nomadism is a phenomenon gradually developed after initiation of Afghan War during late nineteen seventies. They have pave their way for nomadism to Chorh pastures mainly by paying several time higher Qalang rates than the native nomadic, semi-nomadic, transhumant and semi-transhumant pastormals. They usually occupy the valley bottom gentle slopes and hence in direct competition with transhumant and semi-transhumant cattle and buffalo herder. During winter they proceed to the plain of Peshawar, Attock and Fatchjag areas and utilize the roadside, canal sides and other hillside range by paying legal or illegal rent to officials or landowners. The Afghan nomads presently occupy approximately 40% of gentle sloping hillside pastoral areas and valley bottom.

- **Pastoral groups and pasture ownership pattern**

Different pastoral groups visiting the pastoral areas include different groups of local Gujars mostly with mixed livestock population i.e., cattle, buffaloes and goats. Transhumant goat herders called Ajarhs and Afghani fat tail sheep (Balkhi) herders previously doing transhumance between central high Hindukush Mountains in Afghanistan during summer and Kunarh, Paktia and plains of Peshawar during winter, also visit the area and occupy different pastoral niches. The Mixed herder Gujars either spent winter in different hillside dispersed settlements in Alai to the west or in Balimang, Batal, Chatarplain and Batagram lying toward the south and south west sides of Chorh region. The Ajarhs mostly with goat flocks predominantly come from winter scrublands of Kaladaka, followed by those coming from different settlements in Potohar, Topi/Sawabi and Khadokhel/Chagharzai areas of Buner. A few religious (Syed) families from the surroundings of Batal also visit the Chorh with mainly their cattle and buffalo herds. It is also not clear that when the Gujar speaking Gujar population came into the area and started transhumance. However, unlike pastoral areas in Malakand the settlements are relatively permanent and well built. Mosques in different pastoral settlements are claimed to have been a little less than hundred years old. The Gujars and Ajarhs however, know their association with the extended Gujar sub-sections like Chaprha khel, Banjarh, Chechi, Katan Khel and Choan Khel etc., residing in Swat, Buner,
Kashmir and Hazara. Gujars with Hindu and Sikh religion have been reported in western part of Uttar Pradesh and eastern Punjab.

The Gujars with cattle and buffalo herds are in direct competition for pastoral occupation with Afghani fat tail sheep (Balkhi) herders. Approximately one-third pastoral area previously available to cattle and buffalo herds is presently occupied by Afghans. During Afghan war when the summer pasturing areas in Central Afghanistan were no more available to Afghani fat tail sheep (Balkhi) herders, they opted to visit Chorh upland pastures with their flocks during summer. According to estimates of the locals, the Gujars cattle/buffalo herds have been reduced accordingly. The Afghans usually are ready to pay more lease amount, however they have been blamed to exploit the resource destructively. As reported by the Gujars, they spread common salt over a pastoral grazing area and allow their flock to graze it. The sheep in search of salt graze the pasture to the base without discriminating palatable and non-palatable vegetation. Although the uniform grazing of vegetation for short time would be desirable, but the salt accumulation may lead to drastic reduction in the vegetation cover especially the plants with limited salt tolerance. When the Afghans were inquired, their reply was that they previously did the practice but that resulted in heavy consumption of soil with salt and more subsequent metabolic problems and parasitic infestation. At present, they were observed to place salt over the stones for lick. The transhumant goat flock owners are the dominant pastoral group in the region and goat number has seen little reduction in comparison to cattle and buffalo herds due to Afghans. The goat are adopted to steep topography for grazing, hence little affected by Afghans.

Swati tribe residing in Alai predominantly possesses the Chorh pasture, however Kohistani of Palas valley in Kohistan district possesses a minor portion toward the west. The Swatis having traditional ownership in Chorh include eight sub-sections. These include Gailal, Dottial, Jarangial, Ashral, Piay, Loi Bibal, Warhokay Bibal and Shamkorhi. The 24 main pastoral settlements in possession of Swatis include Sarkas, Daregai, Satoool, Mareech, Niki, Qadar Sar, Marhea, Bar Narh, Tarakai, Koo, Habib Kas, Laray Kas, Kooz Patti, Bar Patti, Koz Narh, Shamrada, Taipri, Ghoi Banda, Hana, Mojanr, Giri, Loi Jakh, Warhokay Jakh, Loi Dherh and Warhokay Dherh. The pastoral settlements in possession of Kohistanis include Gaidar, Peech Bela, Dum Bela and Ghoi Bela. Lapakni is another pastoral settlement temporarily occupied by religious groups and is claimed by both Kohistani and Swati tribes.

There is a long history of battles among Kohistanis and Swatis on the pastoral ownership. The invaders are usually the Kohistanis, while the Swatis are the defenders. During the past ten years Kohistanis invaded the Chorh pastures in possession of Swatis two times and were repulsed through joint actions of Swatis and Gujars. The Gujars occupying the pastures during summer consistently show their alliance with Swatis. The Swatis in reciprocation receive nominal Qalang from the Gujars through a nominated settlement head called Muqadam. The Kohistanis on the other hand show harsh attitude toward Gujar and Ajarhs. The Khan of Alai have been given the task to defend Chorh from Kohistani encroachment and in return he is allowed to collect substantial amount of butter oil from different pastoral settlements. During emergency, the Khan is obliged to post his paid fighters at different locations to defend the pastures from Kohistanis. During pasture distribution the Khan family was given the Bar Patti and Koz Patti pastures, however he has purchased many other pastures like Marhea, Laray Kas and Habib Kas and is strengthening his control over other pastoral settlements of Chorh region.

- **Pastoral occupation pattern**

The pastoral settlement is called Baik. In Chorh there are 24 sizable settlements. Each settlement accommodates 25-60 pastoral households. The cattle/buffalo transhumant herders mostly bring
part of their families to pastoral area, while the nomadic/semi-nomadic sheep/goat herders are mostly without families. Each settlement has a well-built Mosque, also serving as a community center and a guesthouse. The settlements are typically 3-6 kilometer apart. There seems little historical evidence about pastoral occupation pattern, however being part of Kashmir the pastures seems to have been continuously utilized since prehistoric times being an environment compelling factor of survival strategies. However, the present occupation pattern is a continuation of the Syed/Swatis pastoral tenure arrangements. 

Two broader non-owner pastoral groups include a short distance, cattle/buffalo transhumant group and a long distance, goat and sheep transhumant, nomadic or semi-nomadic group. The long distance pastoral groups are from Kala Daka, Haripur, Potohar rang/scrublands and Swabi, Topi and Southern/Western Buner. The Afghani pastoralists visiting the area mostly reside outside the usual settlements in tents along with their families. Since the start of Afghani flocks to the pasture, they are the first to occupy the area after spring. The other mobile sheep/goat and cattle/buffalo herds are the subsequent occupants. The earlier arrival of Afghani flocks from the last twenty years may have caused significant directional changes in the phyto-sociology of the pasture vegetation, but not properly documented. According to the native pastoral groups, the relative proportion of leguminous herbs has been reduced. The Afghans are also blamed for throwing salt over pastures to insure thorough pasture utilization of even less preferred forage species. On the contrary, the Afghans reject these allegations. An important innovation of Afghani pastoral groups is the arrangement for watering of pastoral areas particularly in the vicinity of residence. Another important tradition introduced by Afghans is the cultivation of vegetables for the household utility. The Afghans being competitors with the cattle and buffalo herders for gentle sloped potential pastoral sites at present occupy approximately 40% such sites. 

Immigrants from different zones occupy different pastoral niches in Chorh. The two main zones are the hilltops and valley bottoms occupied by sheep/goat and cattle/buffalo herders respectively. Hindko speaking Gujar groups from Balimang/Chattarp lain/Batal/Jargali predominantly utilizes Daregai and Sarkas pastures. Cattle and buffalo herders from Kala Daka area predominantly utilize Satool, Marhia, Barnarh, and Habibkas. Laraykas, Pati, Koznarh, up to Gari and Mojarr are utilized by cattle and buffalo non-owner transhumant herders from Alai down Banna. As the small distance cattle and buffalo herders Gujars have purchased land ownership in their winter areas, hence they occupy specific pastoral areas during summer and winter seasons. The Afghani flocks sporadically occupying Warhokay Jakh, Loi Jakh, Warhokay Dherh, Loi Dherh, Taipri, Gari, Kaigali, Nala, Kanda-Banda, Bar Narh, Marierh, Niki, Satul, Yakh Dherh, Banjarha and Darigai. Lapakni, a pastureland at the boundary between Kohistani and Swati ownership is utilized by impartial religious groups, without giving any lease money to any group involved in ownership conflict. Gaidar and down pasture although part of Chorh are possessed and utilized by Kohistani landowners residing in Palas valley down Chorh pastures. 

The local Swati landowners in the past were much dependent on livestock and transhumant livelihood pattern. They have now gradually shifted during the past 40-50 years to sedentary mixed livestock/staple production system. Those occupying the main villages have at present more dependence on remittances from mega-cities down the country and Middle East. Their herd size has reduced and very few Swati landowners presently visit Chorh with livestock herds. Those still visiting pastures during summer along with their families are those from Maday Khel tribe residing in Mono-cropping zone annexed to the Chorh pastures. However, in spite of visiting Chorh, they prefer to utilize the small upland pastoral stripes within Alai proper outside Chorh proper.

- Qalang pattern and dynamics, and tenant : owner relations
During Mughul time Hazara plains were attached to Attock, while Khanpur, Dhund and Karral areas were part of Gakkhar chief-ship. The Tanawal, Dhamtaur and Pakal areas formed part of Kashmir province. The Swatis were gradually expelled from Swat by invading Yousafzai and they were forced to occupy the river Indus eastern banks for quite some time. The Turks occupying the Pakal plains and surrounding areas were expelled through the joint struggle of Syed (Syed Jalal Baba son of Sayed Ali Termizi “Pir Baba”) and Swatis. Swatis occupied the Chorh pastures, while Kaghan pastures were left to Syed families. The Swatis jointly utilized the pasture along with different non-owner mobile pastoral groups. The Kaghan pastures were leased almost entirely to non-owner mobile pastoral groups. At present, all pastoral areas are given on Qalang for grazing. The usual practice of Qalang is that one main contractor among Ajarhs (Muqadam) being a representative of owner group. Muqadam pay a fixed amount of lease to owner group plus a specific quantity of Desi Ghee per pastoral area to the Khan of Biarai being protector of the Chorh pasture from taking over by Kohistanis. The Qalang rate per pastoral settlement (approximately 7-15 thousand hectares pastoral area) varies from 10-40 thousand rupees distributed among owner families plus 225 kilogram Desi Ghee per pasture for the Khan.

The Muqadam and Gujars jointly work to protect the pastures from occupation by Kohistanis. The Gujars and Ajarh visiting the pasture consider the reduced Qalang rate as a privilege that increase their ownership for the pastures. The Kohistani are themselves pastoral groups, hence their occupation is perceived to reduce their access to the pasture. On the other side the Swatis are not dependant for their livelihood on pastures, hence no chances of future competition. Furthermore, the Gujars recognize Kohistanis for the exceptionally harsh and inhuman behavior. The Muqadam work as a facilitator between owner and pasture users, while extracting surpluses for himself from pasturals keeping in view the desirable complementary owner user relations mainly for political reasons. A Muqadam may earn 100-200 thousand rupees per season and try to attract increased number of pasturals to the pasture under his possession.

The Afghani readily provides three to four times high Qalang rates than the local traditional pastoral groups. Hence, every Muqadam happily allocate the productive pastoral niche to Afghani groups. The Afghani sometimes directly negotiates with the Khan and in some situations, the Khan directly allocates them pastoral area without involving Muqadam. The cattle/buffalo herder pastoral groups feel their direct competition and are worried about the increasing Qalang rates and decreasing pastoral area due to Afghani flocks. The mutually associative owner-user relations are rapidly transforming due to increasing Afghani flocks visiting the Chorh pastures. The Khan himself or his family member also uses to visit once or twice a year to different pastures. The Muqadam are obliged to provide food and services through involving different user families residing in the Baik to such visitors. In addition to the Qalang the users residing during winter inside the Khan political constituency are obliged to vote in favor of Khan family member or his nominee. Such political facilitation is however, not obligatory and the users have gradually attained more political freedom.

4. Indus Kohistan pastures

- General Farming Systems and trends

One of the peculiar characteristics of Kohistan farming system is that the entire population do some type of transhumance and move along with their entire families to different upland pastures during summer. River Indus bifurcates Kohistan district into two almost equal halves i.e., the western half and the eastern half. Kohistan district was created during late seventies. Before seventies, the western half remained with the Swat State for almost 50 years, while the lower part
of the eastern half remained under the formal influence of the Khan of Alai. For quite some time, the upper part of eastern as well as western half remained under the influence of Raja of Tangir. The residents of the western and eastern halves have entirely different languages and customs revealing that the River Indus bifurcation kept both the sides alienated from one another. The eastern half customs and traditions are closer to the residents of Gilgit, Diamer and Kashmir, and have more social and cultural association with them. On the contrary, the residents of the western half are closer to the customs and traditions of Swat Kohistan, Dir Kohistan and Noristan in Afghanistan indicating their closure ethnic and cultural association with them. Hence, Kohistan can be truly termed as an ecological rather than socio-cultural unit.

In general, the topography of the Kohistan comprises of steep terrain with limited scope for cropping. The lower half down Dassu comes under the influence of monsoon rains and has scrubby hill slopes. On the other hand, the uppers half beyond Dassu, receive limited summer rains and have comparatively drier hill slopes. Every settlement on the main riverside or side valley bottom is associated with a particular upland pasture on both eastern and western sides. The pastures toward the western boundary also receive a sizable proportion of non-owner goat transhumant/semi-nomadic and nomadic flocks mainly from southern and eastern Buner, while the pastures on eastern sides are predominantly utilized by local non-owner goat and cattle transhumant groups. The watershed of all Kohistan pastures is emptied in River Indus. The following are the determinant factors of the farming system in Kohistan areas and its pastures.

1. Being annexed to the dominantly sub-humid region of Shangla, rain-fed cropping is the dominant farming system in Dubair valley. The valley is generally narrow and hill slopes are gentle to steep. However relatively frequent rainfall allows reasonable labor output/input ratio to make terraces even on steeper slopes. Both mono-cropping and bi-cropping zones are well bifurcated at visible elevation. The farming system also exist to a lesser extent in Pattan and Baneel/Datra valleys on the western bank, and Kulai and Sherakot/Shiryal region on the eastern banks of River Indus.

2. Where irrigation is possible particularly in the valley bottom wheat and rice cultivation is dominant, while on hill slopes maize production on mono-seasonal and maize plus wheat in by seasonal areas is common. The prolonged winter in the region allows for mono cropping at the major proportion.

3. Population is generally scattered on the hill sloped with social segregation at different ecological niches. However as we move gradually toward north, the decreasing rainfall gradually work to concentrate the population around main water sources, mostly at the valley bottom. In Herban Kot and Basha valley, attached to the Northern semi-arid and arid temperate zones of Northern Areas, the population become typically concentrated in the irrigated valley bottom.

4. Due to remoteness and difficult access, the region has limited association with the markets of down country and the production is mostly for subsistence level.

5. The orchard production is limited to domestic consumption with limited orchard production on commercial scale. Hailstorms are common in southern monsoon region, hence limited orchards. In northern region, limited hailstorms make the area much feasible for orchard production.

Till the establishment of Karakuram Highway, the entire population remained transhumant. A preferred transhumance pattern is three-stage transhumance, i.e., a warm locality on the banks of river Indus, an intermediary stay area, preferably in a mono-cropping sub-alpine zone and finally the upland pastures. The down stream movement follow the same pattern in reverse order. The stay in different zones depends on the grazing and cropping potential of the zone. The consumption level of the population remained lower, hence Saag, milk and milk products and
maize breed, with occasional meat from slaughtered animal at celebratory or sorrowful occasions. The availability of mostly a single and no more than three pair of clothes per person per annum was the norm. No electricity and appliances or vehicles were required. Almost all the households occupied the single roomed simple mud houses with human and livestock herds residing in the same room with occasional semi-permanent partial bifurcation. Most of the daily inputs like sugar, salt and clothes etc. are shifted from down the country. In staple production, in general the area revealed insufficiencies that were procured from the neighboring regions through livestock or livestock products exchange. The gradual shift to non-farm occupations after Karakuram Highway is leading to variation in transhumance. The landowners have decreased the activity, while mostly the non-owner cattle and Buffalo herder are still attached to the activity. With population growth and the limited cultivable land resources, the youth is compelled to proceed to mega-cities down the country for remittances earning. On geographical basis, five main farming systems can be identified in the region. Different farming systems are evolutionary adaptation to provision of occupied ecological niche.

1. Main valley sporadic irrigated farming system on river Indus bank or tributary streams with rice plus wheat/legume fodder alternation-cropping pattern. The powerful landowners groups mostly occupy such fertile areas. Such settlements are available on both western and eastern banks. The livestock is subsistence level and crop residue based mainly goat and cattle. On the adjacent hill slopes maize cultivation is dominant and alternated with wheat cultivation in low altitude areas.

2. The hill slopes with mainly rain-fed farming in southern part are mostly leased to tenants on western sides, usually on share cropping basis. On the eastern bank, in majority of situations the landowners cultivate the land themselves. With increasing altitude, the cropping becomes mono-seasonal and maize is the sole crop. At higher altitudes, the significance of hay and fodder tree leaves increases in the feeding schedule due to prolonged winter and little availability of crop residues.

3. Maize and wheat cropping characterize the rain-fed subsistence tenant system on sloping terraces in southern part. The tenant occupy the areas with more cultivable areas, while the Gujars occupy the areas with more grazing area. On the eastern side, the females play equally in the farming activities, while on the western side mostly males perform the farming activities, except weed thinning performed by women. Among the tenants, female members of the family are mostly involved in farming activities, while most of the male do the non-farm wage labor activity or collect fuel-wood for the land owner in exchange of allowing access to the graze able resource. The non-owner users for domestic utility or sale also collect fuel wood.

4. Livestock is the most important subsistence and exchangeable livelihood resource due to limited cropping opportunities. For the tenants occupying the rain-fed regions livestock serves as the main risk avoidance mechanism under the variable rainfall. Goat followed by beef cattle and sheep are the main component of the herd. Crop residues (maize stalks and wheat straw) and with hay and tree leaves characterize the feeding system during winter, while during summer the entire livestock population subsist solely on grazing. The gradual increase in population is making the rapidly fragmenting local cultivable land resources and per family land unit is gradually reducing its capacity to sustain a family unit.

5. Agricultural production is much less due to limited arable lands and less irrigation possibilities. Rice is cultivated at the valley bottom on streamside terraces and alternated with wheat, while at the rain-fed or spring irrigated hillside gentle slope maize and wheat is alternated. The valley bottom has two crop wheat and maize/rice per year, while the upper
hill slope and shaded areas do have a single maize crop. The landowners occupy the most fertile foothills/valleys. The less fertile with laborious production are leased to tenants. The farmers send their animals for grazing to the hillsides range and scrublands during spring and summer. The fodder shortage for winter is met through stored crop residues, stored hay and tree leaves, while the non-lactating herd member subsist on grazing and browsing throughout the year. **Mulberry** leaves are fed to lactating herd-members during fall season. During summer, the entire population moves to upland pastures only leaving one or two members behind for care of croplands.

6. The least fertile lands with only grazing and browsing potentials are occupied by **Gujars**. The **Gujars** keep goats and cattle and depend mostly upon livestock production. The **Gujars** livestock depends more on grazing followed by browsing, hay making and lopping. The **Gujars** while moving to upland pasture occupy specified areas and in return they provide services in cropping and hay harvesting. Livestock and part of family proceed to the nearby upland pasture for summer grazing, while crop residues, fresh *Quercus incana* tree leaves and hay/dried tree leaves are fed during winter in the high elevation areas. While residing in low elevation areas the use of crop residues and hillside grazing become the dominant option in winter feeding strategies. The steep slopes at middle to high altitudes are mostly covered with patches of oak (*Quercus* sp.) and blue pine (*Pinus wallichiana*) forest.

7. The Transhumant/semi-nomadic herder from Buner and Shangla regions mainly with goat flock visits the Dubair and Kandia pastures during summer. They provide the lease money mainly in kind and occasionally in cash. Many local non-owner transhumant with goat flock, spend the winter on the scrublands on the hill slopes of river Indus banks. They spend 4-5 months during summer at upland pastures (also on lease basis).

There are clear zones of crop systems with respect to altitude, slope and aspect, water availability and soil conditions, while fertility is mainly maintained with manure and casual chemical fertilization. The common characteristics of the traditionally internalized system is the use of local resources in such a way as to support the internal consumption of the rural community as well as for exchange, along with maintaining the productive capacity of the resource base. Production was mainly aimed for subsistence at household or community level. The economic base is shifting to remittances and at present almost every household is in government service or involved in transporting smuggled goods from China. The excavation of Paradote and timber royalty sale is other options adopted to earn livelihood. Those residing on the eastern bank of river Indus used to spend their winter in Haripur and Potohar, while their female serving the local household and male involved in other non-farm and farm level labor work. A household with more children is considered advantageous in terms of more future labor for remittances earning. This result in remittances based population explosion at a comparatively faster rate.

- **Pastoral Sub-systems**

1. **Cattle/goat grazing landowners intensive transhumant pastoral subsystem.** Almost all owner groups in Kohistan valley practice such pastoral system. The system is dispersed throughout the valley. The main utilizing livestock is Cattle and goat. The system mostly comprises of a three-stage transaction, wherein bi-cropping and mono-cropping areas are strategically utilized through family plus tenant labor. Livestock is mostly sent in advance through non-owner cattle/goat herders, while the owner’s family subsequently moves after managing the sowing. The herds utilize the most productive upland, sub-alpine and low land grazing/browsing lands. Stubbling form an important feeding strategy in stage wise downward movement. Crop residues are stored for feeding lactating herd members. In some areas like surroundings of Sholgara, Kulai, Shirakot and Badakot areas, sedentary buffaloes
not intended to move with migratory herds are also part of the family livestock. In these areas the transhumance is limited and sedentary, hay dependent mixed farming system is more dominant. The herd size of the resource owner may vary from 5-50 animals including cattle, goat, sheep and equines for load carry to and from of pastures.

2. **Goat/cattle grazing non-owners intensive transhumant pastoral subsystem.** The pastoral system comprises of the non-owner pastoral groups of Gujar origin. They reside with a particular resource owner tribe and the owner Gujar practice transhumance between the same upland and low land grazing areas. The system is dispersed throughout the district. Main difference between the owner users and non-owner pasture users is that non-owner users are obliged to utilize relatively marginal niches at both upland and lowland areas. Furthermore, the herds of non-owner users are relatively larger than the owner users. The owner users have mixed dependency of crop and livestock, while the non-owner user Gujars exclusively depend for their livelihood on livestock. Non-owner Gujar herds also has relatively limited dependency on crop residues and hay and in many situation they exclusively depend on grazing. The non-owner users have access to the grazing resource in return for family services plus livestock products or live animal for ceremonious occasions. The herd or flock size of non-owner intensive migratory Gujar may vary from 15-150 animals, containing predominantly goat followed by sheep, cattle and equines respectively.

3. **Goat grazing extensive nomadic/semi-nomadic/transhumant pastoral subsystem.** The steep terrain mostly high altitude annexed to the in Dubair and Gabriel valley pastoral areas characterize this subsystem. The main utilizing livestock specie is goat. The Ajarh migration is with or without families. The main regions, where these pastoral groups proceed during winter include Chagharzai, Nawagai and Khadokhel areas in Buner, and Chakaisar, Pooran and Martoong areas in Shangla. They lease is on cash or kind basis. The herd size of these pastoral groups is relatively larger and may have 50-500 animals predominantly goat herds with equines and occasional sheep/cattle mainly due to long distance and difficult migratory terrain. This herder almost entirely depends on grazing at low lands, uplands as well as migratory routes.

- **Pastoral groups and pasture ownership pattern**

The most important pastoral groups are the transhumant pastoral owners, followed by local non-owner cattle and goat herder Gujars and non-local non-owner goat herder Ajars. Transhumant goat herders called Ajarhs visit the area and occupy different pastoral niches situated on the western bank of River Indus. The Mixed herder local non-owner Gujars spend winter in different with or without limited cultivable area on lease or at the cost of providing casual labor to the pasture owners in hay harvesting, crop harvesting, fuel wood collection and residential repair and maintenance. They mostly reside at scrublands at a short distance from landowner settlements. At the upland, the pastoral niche allocated to these groups mostly is separate than those utilized by landowner transhumant pasturals. The Ajarhs mostly with goat flocks predominantly come from winter scrublands of Chagharzai, Khadokhel, Nawagai and Gokan in Buner and scrublands on the western bank of river Indus from Bisham in Shangla district to Amazai in Sawabi district. In Kohistan, they proceed to the pastureland bordering Swat district through its entire length.

On the basis of ownership pattern, the upland pastures on the eastern bank of Kohistan contain the following four broader zones from south to north:

- **Batairha, Kulai and Kuz Palas upland pastures.** These include from south to north The pastoral ownership to the eastern side of River Indus from south toward north is Pastoral area annexed to Batairha belongs to Kohistanis of Batairha. The Kohistanis of Batairha speak different language than the other Kohistani tribes. The pasture is communally owned by different sub-sections of these Kohistani. The pastoral area in their ownership can
accommodate the local landowner livestock and a limited number of local Gujars and religious groups can utilize the pasture for grazing. Kohistanis of Kulai are ethnically correlated with the Kohistanis of Palas, Jalkot, Herban Kot, and Basha further extending to Chilas, Jaglot and even Gilgit. Kulai also contain annexed pastoral area mainly accommodating the landowner livestock. Kuz Palas comprises of Sherakot, Badakot and Sharyal areas to the east of Patan (tehsil headquarters and the biggest village in Kohistan). All the three regions described above contain both sedentary and localized meso-level owner and non-owner transhumant herds. The reason may the small pastoral area owned and a relatively large proportion of croplands as compared other regions in Kohistan. At present, roughly more than 50% of landowners may be transhumant in nature.

- **Bar Palas upland pastures.** The subsequent pastoral area is annexed to Bar Palas valley. This is approximately a 60-kilometer long valley characterized by a relatively large proportion of annexed upland pastures and steep hill-slopes scrublands with limited potentials for cropping. The Bar Palas valley ends in to Chorh pastures and the watershed of Chorh pastures empties in Bar Palas stream. The herd size of the landowner group is the larger than the other Kohistani landowner group predominantly due to limited cropping potential in the valley with consequently more dependence on livestock. The landowner population is almost entirely transhumant. The goat herder local non-owner Gujars also uses part of upland pasture and low land scrubslands.

- **Supat upland pastures.** The supat pastures situated at the end of Jalkot valley starting from Dassu (district headquarters of Kohistan district) on the eastern bank of River Indus are the largest upland pastures in Kohistan. During summer the landowners pastorals occupy the valley bottom and goat herder local Gujars occupy the remote or steep areas in Supat upland pastures. Occasionally non-local nomads, semi-nomads or Afghani herds occupy parts of Supat pastures during summer. The travelling distance, regular availability of the landowner groups at pastures and relatively rude and non-friendly behavior of the landowner Kohistanis of Jalkot valley toward these pastoral groups might be the possible reasons, despite the fact that the Supat pastures seems to be comparatively less stocked.

- **Heban Kot and Basha upland pastures.** The annexed smaller upland pastures with Herban Kot and Basha follow Supat pastures toward the north and these upland pastures also have a localized utility and can hardly accommodate long distance non-owners extra pastoral groups. However, local non-owner pastorals do exist in Harbankot and Basha pastoral system, but in relatively smaller number than those visiting Supat pastures.

On the basis of ownership pattern, the upland pastures on the eastern bank of Kohistan contain the following four broader zones from south to north:

- **Dubair valley upland pastures.** Dubair valley is the most thickly populated valley in Kohistan due to land fertility, more rainfall and higher proportion of cropping lands. These pastures border Kana/Lilaunai pastures toward south and Chail/Bishigram pastures toward the west situated in Shangla and Swat district respectively. Pastoral groups from outside Kohistan reach Dubair pastures through different routes in Shangla district. Different sub-sections of Kohistani people ethnically related to the Kohistanis in Kalam and Dir Kohistan possess shares in communally owned upland pastures. In the past the ownership was equally distributed among sub-sections. However during the era of Swat Swat state, when these areas were controlled by the State administration. The Walis facilitated fractional leadership and consequently two opposing main families were facilitated to gain power as Maliks in the valley. This worked to shift ownership of a major proportion of the lands to these families through purchases or confiscation of individually owned croplands as well as communally owned upland pastures. Many Kohistani families were reduced to the status of tenants. Apart from the cattle and goat herds belonging to the big landlords and ordinary small share holder
landowners, tenants, locally residing livestock dependant non-owner Gujars and non-local Goat herder Ajars visit Dubair upland pastures during summer. During summer the landowners pastorals occupy the potentially productive and relatively accessible pastoral sites and goat herder local Gujars and non-local Ajars occupy the remote or steeper areas.

- **Baneel, Datra, Keyal and Semo Dara upland pastures.** Different sub-sections of Kohistani people ethnically related to the Kohistanis of Dubair valley possess ownership shares in communally owned upland pastures. However, unlike Dubair valley all the Maliks have a comparable ownership share in individually owned cropland and communally owned upland pastures. The pastoral areas annexed to Pattan are relatively smaller than the upland pastures of Dubair valley. Mainly local Kohistani landowners and local non-owner Gujars send their herds to these areas during summer. Limited numbers of non-local goat herder Ajars families also occasionally visit these pastures.

- **Razaka and Doga upland pastures.** These pastures are situated in the vicinity of Seo. Different sub-sections of Kohistani people ethnically related to the Kohistanis of Dubair valley possess ownership shares in communally owned upland pastures. All the Maliks have a comparable ownership share in individually owned cropland and communally owned upland pastures. These are smaller pastures as compared to the remaining pasturelands on the western side of river Indus. One of a peculiar characteristic of these pastures is their close proximity to the winter grazing scrublands and settlements. One can easily climb to the upland pastures from Seo and Doga on foot in no more than three hours. Mainly local Kohistani landowners and local non-owner Gujars send their herds to these areas during summer. Limited numbers of non-local goat herder Ajars families also occasionally visit these pastures.

- **Kandia valley upland pastures.** Kandia valley, a 60-70 km long valley pastures are presumed to be the largest pastures in entire Kohistan district. These pasture borders with the upland pastures of Mahodand Valley toward the west and Darel/Tangir and Karga Nalla pastures in Gilgit toward the north. Pastoral groups from outside Kohistan reach pastures either through the vertical limits of Dubair pastures, through Mankial valley and rarely through Matiltan in Kalam region. Different villages approximately ten-kilometer apart, like Tuti, Jachshoi, Karang and Gabrial have ownership rights on different pastoral niches easily accessible to them. All the Maliks residing in different villages have a comparable ownership share in individually owned cropland and communally owned upland pastures. Mainly local Kohistani landowners and local non-owner Gujars send their herds to these areas during summer. However, huge number of non-local goat herder Ajars families mainly from Buner also visits upland pastures particularly annexed to Karang and Gabrial villages and rarely to those annexed to Tuti and Jachshoi.

- **Pastoral occupation pattern**

Mobile pastoral system seems to be obligatory for the residents of Indus Kohistan throughout its history due to limited cropping potentials. After the establishment of Karakuram Highway during mid seventies, some households have shifted their dependence to non-farm income opportunities. However still more than 90% household practice different degrees of mobile pastoral systems. In general there exist a three stage mobility patterns. For example, in Pattan the landowner pastoral groups occupy the settlements near Pattan on the river Indus bank during winter. During dry summer after maize sowing the pastoral families start movement to the settlements near Baneel, Datra and Gir Birh, where they apart from grazing in the sub-alpine forests and pasture also sow the maize on terraces owned by these people. With the onset of wet summer, they proceed to Simo Darra pastures. With the onset of early autumn, they start the return movement in the same order. Their return coincides with the maize-harvesting season followed by stubbling of the
harvested field. The maize stalk collected at Baneel, Dattrra and Gir Birh as well as in their winter settlements near Pattan serves for feeding the wintering cattle. The goat and sheep depend throughout the year on grazing and browsing.

The pastoral landowner groups in Supat, part of Kandia valley, Dubair valley and Batairha follow the same mobility pattern like that available in Pattan region. The pastoral groups in Razaka, Herban Kot and Basha have generally a simple two-stage mobility pattern. They may spend some time in sub-alpine area but without involvement in cropping. In Koz Palas, the relative availability of more croplands leads to partial transhumance among landowner groups. Hence part of family may move to upland pastures with non-lactating herd members and goat, while the other part may opt to stay to look after cropping and lactating cattle and buffalo herd members. The Bar Palas residents also practice in general a three stage mobility pattern, however the valley has limited cropping potentials, hence the mobility pattern is based on forage availability at different locations during different seasons rather than on sowing and harvesting. At upland pastures, the landowner pastoral groups in general occasionally produce vegetable for their domestic utility near the main settlements.

The non-owner cattle and goat herder Gujars occupy marginal areas throughout the three stages pastoral occupation patterns. At winter settlements, their cattle and goat dependence is more on grazing and browsing rather than crop residues and stubbling. They are hence obliged to invest more labor in herding livestock at remote ecological niches at all the three stages of mobility. In general the landowners select the most yielding pastoral sites at different locations, while the non-owners are left with the hardly accessible and areas with limited forage production potentials. Although the residents of both the landowners and local non-owners are closer enough so that the landowners can utilize the services of non-owners as and when desired. The Ajarhs coming from Buner and Shangla through different migratory routes utilize the ecological niches hardly accessible by both landowner pastoral groups and local non-owner Gujars. The landowners only link with these groups is for the reception of Qalang either in cash or kind. The Ajarhs visit these areas without bringing female family member mainly due to hard trekking routes, hard terrain of occupation and lack of security mechanisms for their families.

Cattle, sheep, goat flocks use different ecological niches even in the same pastoral region. The cattle herds mostly occupy the valley bottom or other gentle sloping hillside areas. The goat occupies the pastoral strips on mostly steep hill slopes and narrows side valleys. The goat dominant non-owner Gujar flocks usually utilize the steep sloping portion of the pasture, while sheep and cattle dominant herder occupies intermediate to gentle sloped areas. Owners and non-owners may occupy the semi permanent colonies in mixed or separate regions depending on topography terrain and accessibility to water sources. Almost all the Kohistani pastoral in the past used to shift to upland pastures during summer with their entire families and after return during autumn, they used to collect fodder and fuel for winter scarcity. The only item they required from exterior was the common salt. Different types of grains primarily including barley and wheat were grown at subsistence level. Locally woven woolen clothes were routinely worn and skins were tied around feet, while travelling longer distances. With the growing attachment with the market, they are now more dependent on market for cloth, shoes and other household utilities, while pastoral systems due to extensive labor input requirement is gradually leading to become a secondary level subsistence activity. At present, the aged family member mostly carries on the activity, while the younger generation is opting to adopt non-farm activities.

• **Qalang pattern and dynamics, and tenant : owner relations**
Two types of Qalang patterns are prevalent for non-owner pastoral groups in Kohistan in return for allowing access to the pastures. The local non-owner Gujars have access to the pastures in return for family labor provided to the landowner group in sowing, crop and hay harvesting, livestock grazing, fuel wood collection and mud house construction and plastering. Different landowner groups residing in different valleys have developed different pasture use relations with the non-owner Gujars. The non-owner local pastoral groups are leading a life nearer to the rules as defined by the customary slavery of the past. Most of these Gujar families have never visited areas outside Kohistan. They can hardly speak languages other than Gujri and Kohistanis. Most of them can hardly think of disobeying their masters. The landowner Kohistanis also keep them to remain at the lowest level of subsistence and reduce their flocks through demands for slaughtering animals at celebratory and sorrowful occasions. The Kohistanis can establish marital relations with or can forcefully keep the Gujar woman in his custody and the Gujars can not show any hesitation. On the other hand, the Gujars are not allowed to establish marital relations with Kohistani women.

The other type of Qalang practices in Kohistan is in the form of live animals or its output. This type of Qalang pattern is applicable to the non-local goat herder Ajarh visiting Dubair and Kandia valley. The Qalang pattern is decided between the representatives of the pasture owners or Maliks and the concerned Ajarh group without involving intermediaries. Depending on the flock size either mutually agreed quantity of Ghee or 1-3 goats per flock are procured in return for allowing access to the summer pastoral areas. The Ajarhs mostly make pastoral contract with powerful Maliks to minimize threat of claim from other Kohistani landowner groups. In general, transhumant and semi-nomadic Ajarh groups used to visit the area. These include those understanding and capable of acting in the local socio-political frame. The casually visiting nomads can only use the pasture in association with an Ajarh having an established tenure understanding of the system.

Qalang based on Kind rather than cash has been observed to limit temporal variation in comparison to the trends prevailing in other pastoral areas. The vast pasture poses limited competition among herders. Furthermore, the gradual shift of landowners to non-farm occupations is gradually reducing their herd number and size. The behavioral problems with local Kohistani landowners limit the attraction to other non-owner mobile pastoral groups. The pasture of Kohistan are either hardly accessible or with difficult terrain. The decrease of winter grazing areas in Buner by 38% and increase in Qalang of winter grazing areas have compelled many Ajarhs to either left the job, reduce their flock size or occupy alternative grazing areas like canal, and roadside grazing (Leede et al., 1997). All these factors work together to keep the upland pasture of Kohistan relatively less stocked with limited or adjustable temporal variations.

5. Naran pastures

- General Farming Systems and trends

Naran pastures lies to the north of Mansehra, east to Chorh pastures and west of Neelum valley in Azad Jammu and Kashmir. The watershed of the pastures empties through river Kunhar into river Jelhum. The pastures are attached to Diamer valley through Babusar pass in the north. Despite availability of different types of mobility patterns, the ownership of the major proportion of the Kaghan pastures is with the Syed of Kaghan. The people from Chilas have some user rights to a minor proportion of Kaghan pastures. The following are the determinant factors of the farming system in and around the Naran pasture.
1. Being a dominantly sub-humid region rain-fed cropping is the dominant farming system in Kaghan valley.
2. Where irrigation is possible particularly in the valley bottom rice and wheat cultivation is dominant, while off-season vegetable cultivation is gradually replacing the staple production. On hill slopes maize production on mono-seasonal and maize plus wheat in by seasonal areas is common.
3. Population is generally scattered on the hill sloped with social segregation at different ecological niches.
4. The prolonged winter in the region mostly allows for mono cropping.
5. The orchard production is limited to domestic consumption with limited orchard production on commercial scale. Hailstorms are also common in the region.

The landowners are predominantly absent landlord Syeds, while mostly the non-owner cattle and buffalo herder are still attached to local level transhumance in addition to non-local nomadic and semi-nomadic sheep and goat herders visiting the region from Potohar region in the northern Punjab during summer. In general, a sizable proportion of the population is still depending on subsistence level farming. The trends are that dependence on subsistence level staple production and pasturing are gradually shifting to the evolving earning professions in modern sector. Most of the daily inputs like sugar, salt and clothes etc. are shifted from down the country. During the past, almost all the population was semi-transhumant in nature mainly depending on pasturing of cattle, goat, sheep and buffaloes along with subsistence level terraced farming at lower elevations. However now the gradual shift to cash crops. In addition, tourism promotion in the area is leading to creation of many non-farm occupations. With population growth and the limited cultivable land resources, the youth is compelled to proceed to mega-cities down the country for remittances earning.

On geographical basis, five main farming systems can be identified in the region. Different farming systems are evolutionary adaptation to provision of occupied ecological niche.

1. Main valley irrigated farming system surrounding Kunhar stream between Balakot and Kaghan has rice plus wheat/legume fodder alternation-cropping pattern. Such fertile areas are mostly occupied by the land owners powerful groups with relatively dense settlements. The livestock is subsistence level and crop residue based and the herd size may vary between 2-10 animals mainly cattle and buffaloes. On the adjacent hill slopes maize cultivation is dominant and alternated with wheat cultivation in low altitude areas. The hill slopes with mainly rain-fed farming are leased to tenants mostly on share cropping basis. With increasing altitude, the cropping becomes mono-seasonal and maize is the sole crop. The significance of hay and fodder tree leaves increases in the feeding schedule due to prolonged winter and little availability of crop residues at high altitudes.

2. Rain-fed subsistence tenant and Gujar depending on livestock and maize/wheat cropping characterize the farming system on gentle to steep hill slopes near Garhi Habibullah and Balakot. The tenant occupy the ecological niches with more cultivable areas, while the Gujars occupy the areas with more grazing area. The tenant/landowner relationships are still partially on sharecropping and partially on cash basis. Among the tenants, female members of the family are mostly involved in farming activities, while most of the male do the non-farm wage labor activity or collecting fuel-wood for sale in the nearby villages and small towns. Livestock is the most important risk avoidance mechanism under the variable rainfall. When the crop fails to bear grains, it is harvested for livestock feeding and increased subsequent livestock number avoids the risk. The least fertile lands with only grazing and browsing potentials are occupied by Gujars. The Gujars keep buffalo, cows and goats and depend
mostly upon livestock production. The Gujars livestock depends more on grazing followed by browsing, hay making and lopping. Livestock and part of family proceed to the nearby upland pasture for summer grazing, while crop residues, fresh *Quirccus incana* tree leaves and hay/dried tree leaves are fed during winter in the high elevation areas. While residing in low elevation areas the use of crop residues and hillside grazing become the dominant option in winter feeding strategies. Beef cattle are the main component of the herd owned by Gujar. The limited market availability for milk and its perishability is compelling for its conversion to milk products to be used both for subsistence and market. Crop residues (maize stalks and wheat straw) and concentrates characterize the feeding system. Hillside grazing significantly contributes to livestock feeding. Lactating goats are more numerous with the small landowners and tenants, which consume tree leaves, and do browsing the nearby hillside. Stubble is carried out for longer duration than the irrigated system, as the farmers have to wait for rainfall before re-sowing. The gradual increase in population is making the rapidly fragmenting the locally available land resources not able to sustain a family unit.

3. While moving toward Kaghan from Balakot, the water availability for irrigation on hill slopes of the main valley and side valleys increases and the farming system on hill slopes transforms to the gentle slope terraced mixed farming system. This is a relatively complex and is the main characteristic farming system of almost all the narrow side valleys. It is characterized by more dependence on livestock than crops. In general, cropping tends to be concentrated on gentle, less erosive slopes with deeper inherently fertile soils, having tendency for moisture retention. Rice is cultivated at the valley bottom on streamside terraces and alternated with wheat, while at the rain-fed or spring irrigated hillside gentle slope maize and wheat is alternated. The valley bottom has two crop wheat and maize/rice per year, while the upper hill slope and shaded areas do have a single maize crop. The landowners occupying the area keep mostly stall-fed cattle and buffaloes for subsistence through crop residues or hay collected from cropland boundaries. They occupy the most fertile foothills/valleys. The less fertile agricultural soils are leased to or owned by tenants. The farmers send their animals for grazing to the hillsides rangelands during spring and summer.

4. The Transhumant/semi-nomadic system is the main commercial traditional production system. The population of sheep and meat type goat is principally limited to transhumant herders, and they are solely dependent on grazing and browsing on hillside except in winter, when tree leaves are fed during rainy days, and where no grazing and browsing is possible. The nomadic shepherds used to move between Naran upland pasture, and low land winter ranges in Haripur, Taxilla, Fatehjang and Talagang areas of Potohar region. Sheep and goat flocks from Buner and Sawabi also occasionally visit the Naran pastures. The landowners or state lease the faraway low elevation hill slopes to nomads for 5-6 month during winter. They spend 4-5 months during summer at upland pastures (also on lease basis). A significant number of Afghani nomads with fat tail Balkhi sheep also visit the Naran pastures from the last 20 years.

- **Pastoral Sub-systems**

Different pastoral sub-system depending on the Naran pasture include:

1. **Cattle and Buffaloes grazing semi-transhumant tenant based pastoral subsystem.** Although in the past, all the area up to Babusar pass was considered upland pastures. However, with the establishment of road network, tourism promotion, and use of the area as a passage route to northern areas permanent settlements established throughout the main valley. These include settlements like Tumtuma, Sehouch, Batakundi, Maidan, Daranda, Kahora, Rewrhi, Dabouk, Dhonga, Shelibela and Baans. The residents of these areas are the previous
tenants that either purchased some cultivable area, or illegally occupied the surrounding pastoral area used for cattle and buffalo grazing. During winter majority of the residents, move to the surroundings of Balakot with their families and livestock. Main Naran valley bottom from Naran to Shelibela and predominantly gentle sloped downward pastures characterize this subsystem. The main utilizing livestock is Cattle and Buffaloes. During the past, all these residing groups practiced transhumance comparable to the Gujar. However gradually with the introduction of off-season vegetable cash crop permanent residences were established at upland areas with gradual transformation to semi-transhumance and sedentary occupation.

2. **Cattle and Buffaloes grazing semi-transhumant Gujar based pastoral subsystem.** Bottom lands of the side valleys pastoral areas like Neeli Naddi, Lake Saiful Maluk, Domail, Ratti Gali, Lalazar and Manoor valley are utilized by cattle and goat herder Gujars. These Gujars shift to Balakot, Garhi Habibullah, Mansehra and Lora regions for winter grazing. In winter grazing areas the Gujars either have purchased ownership, or have long term tenancy arrangements with the landowners. Those with entire dependency on livestock have larger herds, however their dependency on livestock is gradually decreasing. The reason is that with the consent of absent landlords they are gradually becoming more dependant on off-season vegetable production and their purpose for transhumance is shifting from livestock to cash crops. The main utilizing livestock are Cattle and Buffaloes.

3. **Sheep/goat grazing nomadic/transhumant pastoral subsystem.** The steep terrain mostly high altitude annexed to the main valley and side valley pastoral settlements in Kaghan/Naran valley characterize this subsystem. The main utilizing livestock specie is sheep and goat. The flock may either comprise entirely of goat, sheep, or mixed flocks. The flock composition depends on accessibility to ecological niches in winter or summer. Hence those having access to steep slopes and scrublands have predominantly goat and those having access to grass dominant grazing lands and relatively gentle topography have predominantly sheep flocks. The sheep and goat flocks hence remain dispersed throughout the upland pastures on the basis of ecological suitability. The sheep and goat herder Ajarh mostly migrate with families and occupy small settlements available at different ecological niches. These settlements contain 5-20 households and may accommodate cattle, buffalo, sheep and goat herders according to the provisions of ecological niche.

4. **Afghani fat-tail sheep nomadic pastoral sub system.** Afghani fat tail sheep, nomadism is a phenomenon gradually developed after initiation of Afghan War during late nineteen seventies. They have pave their way for nomadism to Kaghan/Naran pastures mainly by paying several time higher Qalang rates than the native nomadic, semi-nomadic, transhumant and semi-transhumant pastortals. They usually occupy the valley bottom gentle slopes and hence in direct competition with transhumant and semi-transhumant cattle and buffalo herder. During winter they proceed to the plain of Peshawar, Attock and Fategjang areas and utilize the roadside, canal sides and other hillside range by paying legal or illegal rent to officials or landowners. Afghani pastoral groups establish separate tented settlements. Bottom lands of the side valleys pastoral areas in Baisal, Jalkhad, Baboon, Jabba, Deela, Maidan, Das Chalee, Rattigali, Jalkhad Narh, Khotha Narh, Phutha Narh and pastures surrounding Lake Lulusar are utilized by Afghani flocks. The Afghan nomads presently occupy approximately 30% of gentle sloping hillside pastoral areas and valley bottom.

- **Pastoral groups and pasture ownership pattern**

Different pastoral groups visiting the pastoral areas include different groups of tenants including those with ethnic background of Swati, Qureshi, Awan and Mughal. The Qureshi, Awan and Mughal are shown in the settlement record as Kashmiri. However, these groups deny Kashmiri ethnic origin. The livestock herder groups include local Gujars mostly with mixed livestock
population i.e., cattle, buffaloes and goats. Transhumant goat herders called Ajarhs and Afghani fat tail sheep (Balkhi) herders. These groups visit Naran pastures though a mutually agreed tenure relationship with the pastoral landowners. The Kashmiri and Swatis have originally come from Kashmir valley, Muzafarabad and Mirpur areas. They have however now permanently settled in Kaghan valley and many have purchased ownership either in Naran or Balakot rain-fed hill slopes. The Swatis have come after losing land in Pakal, Batagram and Alai due to animosity or poverty and many have purchased ownership either in Naran or Balakot rain-fed hill slopes. The Mixed herder Gujars either spent winter in different hillside dispersed settlements surrounding Manshehra, Balakot, Garhi Habibullah and Lora. The Ajarhs mostly with goat flocks predominantly come from winter scrublands of Haripur, Taxilla, Hassan Abdal, Toopi, Sawabi and Khadukhel area in Buner. The sheep flock owner Ajarh coming from different hillside settlements near Manshehra, Abbottabad, Garhi Habibullah and grass dominant gentle sloped rain-fed rangelands in Potohar. The Gujars and Ajarhs claims to have association with the extended Gujar sub-sections like Chaprha khel, Banjarh, Chechi, Katan Khel and Choan Khel etc., residing in Swat, Buner, Kashmir and Hazara.

The Gujars with cattle and buffalo herds are in direct competition for pastoral occupation with Afghani fat tail sheep (Balkhi) herders. Approximately one-third pastoral area previously available to cattle and buffalo herds is presently occupied by Afghans. According to estimates of the locals, the Gujars cattle/buffalo herds have been reduced accordingly. The Afghans usually are ready to pay more lease amount, however they have been blamed to exploit the resource destructively like those in other pastoral areas. The subsequent reduction of Gujar herd size due to gradual involvement in production of off-season vegetables have paved the way for accommodation of Afghani flocks. The transhumant sheep and goat flock owners are the dominant pastoral group in the region and sheep and goat number has seen little reduction in comparison to cattle and buffalo herds due to Afghans. The sheep and goat are adapted to relatively steep areas not suitable for cropping, and the ecological niches utilized by sheep and goat flocks are different in nature than those occupied by Afghans hence little affected by Afghans.

According to the revenue-record of 1946-47 the total communal lands in Kaghan valley measures to 2732735 Kanals and 16 Marlas. Of this total communal land, 2675719 Kanals and 2 Marlas were declared communal grazing land. In the remaining land 5798 Kanal and 3 Marlas cultivable communal land were allowed in the possession of landlords, 5771 Kanal and 6 Marlas cultivable communal land in the possession of tenants and 1622 Kanal and 15 Marlas in possession of Forest department as forest annexed. The grazing lands so declared are not allowed for distribution and fragmentation. According to the traditional land measurement mechanism to total communal land comprised of 165 Jurhi or Rupia. Of the total land 60 Jurhi were owned by Syed Muzamil Shah son of Syed Qasim Shah while 20 Jurhi belonged to other Syeds. Of the remaining, forty Jurhi were in the possession of other tribes, while the rest have been sold out by Syeds and mainly procured by tenants and Gujars through purchased ownership. Syed Muzamil Shah family accumulated the land through purchase of ownership rights from other Syeds. Otherwise, the communal land was equally distributed among different Syed families. The entire Kaghan was granted to the Syeds after expulsion of Turk Karlagh families (reported to have come with Timorlane in 1399). The expulsion was materialized through the joint efforts of Swatis and Syed Jalal Baba, the forefather of Syeds and the son of Pir Baba (Syed Ali Termizi resident in Buner) during early 18th century. Before that, Kaghan formed part of Kashmir valley.

In the revenue record the tenants in possession of cultivable communal land were supposed to pay rent to the State and not to the Syeds. However, later the influential Syed included their names through different means in the column of owners. The tenure disputes in Kaghan valley between
tenants and landowner Syeds are still under process in different levels of judicial courts. However, the landlords Syed are able to extract benefits in different forms through mutually agreed tenure arrangements through degrading exploitation of the fragile communal pastoral resources. The tenants due to their weaker political position are finding it difficult to establish their tenure rights despite the fact that they are the actual users of the land and the Syed find it difficult to evacuate these users. To solve the tenure dispute the Government of NWFP established different judicial land commissions, however no progress has been made on the ground. Three pastoral areas at the northern end of Kaghan valley surrounding Lulipat Sar Lake i.e., Gitidas, Lohi Halhal and Kamil Bashi are possessed and utilized by Chilasi people belonging to Diامر district of the Northern Areas.

- **Pastoral occupation pattern**

The mobile pastoral systems are probably practiced in the region since pre-historic times. There existed a high degree of dependence of the local population on livestock and nomadic/pastoral systems existed in the region beside forest, orchards and subsistence level grain production. The available literature reveals little about the pastoral occupation pattern during different historical period, however most of the production seems to have principally aimed for subsistence rather than commerce. The main exchange items were milk and wool products and handicrafts. The Naran pastoral systems were probably part of Kashmir pastoral system and Kashmir valley, Neelum valley and Naran valley were probably part of a single larger pastoral system with summer pastoral areas extending up to Jelhum, Gujrat and Gujranwala. The pastoral system has been reduced gradually with the cropping extension to the previous summer as well as winter grazing areas.

Cattle, buffalo, sheep and goat flocks use different ecological niches and usually different pastoral regions. The cattle and buffalo herds mostly occupy the valley bottom or other gentle sloping hillside areas. The transhumant mainly goat herders occupies the pastoral strips on mostly steep hill slopes and narrow side valleys. The shepherders mainly occupy the gentle sloping hill slopes. The terrain of Naran valley has enormous grazing scope for sheep flocks. The Afghani flocks are the early occupants with the onset of dry summer after middle of May. This is followed by Ajar sheep and goat flocks initially occupying low lands and subsequently moving upward with the gradual arrival of the cattle and buffalo herds. The entire pastoral movement may take not more than 40 days.

During the past the pastorals used to spend 15-25 days during unilateral movement. There existed an array of resting places throughout the transit routes. Furthermore, while travelling the livestock used to graze on the hillside in the vicinity of migratory routes. The resting-places have gradually encroached for cropping. The hill-slopes are gradually individualized and hence closed to the trespassing livestock. As a result the migratory flocks are obliged to travel continuously without grazing and resting at least for 2-3 days causing about 15 days early arrival at the upland pastures. The landowners being absent landlords never practice transhumance and almost all the pastoral occupants are non-owner users and tenants. The settlements comprise of semi permanent colonies each accommodating 5-20 households in mixed or separate regions depending on topography terrain and accessibility to water sources. Their families accompany most of the pastoral groups.

- **Qalang pattern and dynamics, and tenant : owner relations**

According to the revenue record of 1907 (Wajib-ul-Arz) the resident tenants were not obliged to provide grazing fee to the landlords, while those visiting from outside are obliged to provide grazing fee per head. The rate of grazing fee for example was one ram or buck per hundred sheep...
and goats, and 2-kg butter oil per lactating cow. The pastoral area of Gitidas was used against the payment of Rs 50/- grazing fee procured annually from the users and the amount subsequently distributed among the communal landowners according to their share in landed estate. Under the present situation, the grazing fee is procured at Kaghan Bridge in cash according to the present rate of ram or butter oil.

With the advent of cash crops specific ownership fee is procured on the produce comparable to those of livestock, for example price of one bag of potatoes per hundred bags of potatoes transported to the market. The fee is procured through government officials and subsequently distributed among all the shareholders according to their share. In order to procure more output from the communal land the bigger shareholders facilitate nautor (transformation of communal pastureland into cropping land).

Not only the grazing fee is procured, but also another mechanism of procuring surpluses is through Muqaddam (middleman caring for a particular pastureland). The Muqaddam are the representative of the landlords nominated on long term basis for each pastoral settlement. No herder can utilize the pasture without the permission of Muqaddam. The Muqaddam not only arrange the informal leasing of the pastureland to tenants and Gujars for off-season vegetable production, but also procure extra grazing fee for allowing a herd or flock to use a pastoral area. The Muqaddam in return for his appointment arrange one bull per pasture to landlord on annual basis, but also provide equal share in receipt from leasing the pastureland for cropping.

The Afghani nomads like in other pastures are ready to pay additional lease amount to Muqaddam for a particular pastoral area. The amount so paid remains 3-4 times higher than those provided by the traditional local herders. The reason might be that being new comer to the traditional system they couldn’t create a space for themselves unless they pay high rates for pasture utility. Secondly their production system is more yielding as they practice more effective livestock production and marketing practices that possess the scope for paying higher rates of grazing or pasture utility fee. At low lands while proceeding to Punjab province the winter scrublands is either provided to the Punjab Forest department on per animal basis or to a landowner on pastoral area basis.

**Size, composition and dynamics of the pastoral flocks/herds**

The average flock size occupying upland pastoral areas in Swat and Dir Kohistan has been estimated by Ajarhs to be 250 animals. The herd size may generally vary between 200-300 animals. The poor families may even have 30-60 sheep and goat and 3-6 families may join to form a single large herd sharing their grazing, Qalang and transaction labor, while coming to upland pastoral area. At low land grazing land they separate their animals and independently graze the rangelands leased by them.

The size and composition of different pastoral groups vary in Chitral region not only varies among different social groups but also during different seasons due to different reasons. The principally goat herder non-owner Gujars are obliged to base their livelihood on livestock and mostly carry out long distance to and fro movement of upland pastures. Hence, their relatively larger herds mainly comprise of goats. To the landowner semi-transhumant herder a much larger choice is available. His livelihood may also depend on multiple assets like cropping, local non-farm service sector, orchards, tourism and remittances earning down the country. Hence, the herd his family unit possess is generally much smaller and for much diverse utility as compared to the nomadic/transhumant non-owner herder. The general per family herd size may be directly proportional to land productive capacity in relation to the dependent human population.
Kailash valleys in Chitral include Bamborait (680 households), Bireer (450 households) and Ramboor (130 households). Only 40% of the total households in the three valleys are following original Kailashi customs, while the rest are either migrated Muslims from outside or are locally converted Muslims. In Bamburait valley, the approximate total livestock population includes 6500 goat, 1950 cattle and 560 equines to make subsistence requirements of approximately 5000 population. Hence, each household on average contains 10 goat, 3 cattle and less than one equine. Fifty year’s back, the population was one tenth of the present population, however every household possesses 200-300 goat. Now only a well to do household may have 50-60 goat. Five percent well-off farmers herd in the village may contain 30-50 goat and 8-12 cattle. The poor farmer cattle herd is usually devoid of plough bulls and he is obliged to obtain it from other farmers. The farmers with average income usually have a single plough bull and two average farmers may join to plough their fields with joint pair of plough bulls. During summer all the herd members except the lactating cattle and goat are shifted to pastoral area, while the lactating animal graze the pastures in the vicinity of main village. The main villages in Bamborait valley include Wadus, Palolandeh, Ahmadabad, Anaish, Baroon, Batrik, Kansar, Karakal and Shakhanandeh, while the main pastoral areas include Shool, Baghbarreet, Otak, Astoi, Zenoor and Acholgahh.

The total number of households in Besti Arkari is 138 with 866 human population. The total number of cattle in the village is 652 cattle, 1523 sheep and 2100 goats. Hence, the average household contains 15 goats, 11 sheep and 5 cattle. The cattle herd mostly contains a pair of plough bulls for average and relatively well of farmer. Five percent well-off farmers herd in the village may contain 30-50 goat and 25-40 sheep. The poor farmer cattle herd is usually devoid of plough bulls and he is obliged to obtain it from other farmers. The farmers with average income usually have a single plough bull and two average farmers may join to plough their fields with joint pair of plough bulls. During summer, all the herd members except the lactating cattle and goat are shifted to pastoral area, while these animals graze the pastures in the vicinity of main village.

Approximately 200 hundred flock of nomadic/tran shumant Gujars containing 32640 goat used to occupy the Goleen pastures. The total number of semi-tran shumant goat utilizing the pastoral areas has been estimated to be 3360. Goleen valley reportedly contains nine small settlements mainly depending on Dokgol and Roghiligol pastures. Out of the total 280 household permanently residing in the entire Goleen region, the total number of households in Goleen depending on Roghiligol pastures is 146 households. They are residing in Azghore (14 households), Goleen Chashma (44 households), Goleen Pain (43 households) and Goleen Bobaka (45 households) with approximately 1250 human population 2300 goats, 450 cattle and 60 equines. Astore, Birmogh and Shamkan are the other important permanent settlements. Only one-third households are reported to have livestock, while the remaining households are presently depending on non-farm occupations. The approximate per household livestock population contain 8 goat, 3 cattle and one equine per three households. The cattle herd mostly contains a pair of plough bulls for average and relatively well of farmer. Five percent well-off farmers herd in the village may contain 30-50 goat or 8-10 cattle. The poor farmer cattle herd is usually devoid of plough bulls and he is obliged to obtain it from other farmers. The farmers with average income usually have a single plough bull and two average farmers may join to plough their fields with joint pair of plough bulls. The local population had limited dependency on the pastures. The Roghiligol pastures were utilized mainly by tran shumant Gujars coming from Baroz. However, probably for the purpose of ownership confirmation over the pastures the local residents have banned the grazing of tran shumant as well as their own animals and the user rights dispute is under process in the local courts of Chitral between tran shumant and semi-tran shumant pastoral
groups. Prior to the dispute over pasture use, during summer all the herd members except the lactating cattle and goat were shifted to pastoral area, while the lactating animal were mostly intensively fed or stubble the fields and protected pastures in the vicinity of main village after crop and hay harvest.

The herd-size of non-owner Gujar doing nomadism/transhumance in Chitral resides during winter in Ayun, Baroz, Sheshikoh, Drosh, Ashrait and Arandu. Their herd may contain 150-300 goat and 3-5 lactating cows and 2-5 equines. The total number of Gujar households in all these areas may be 1200-1400. The main concentration is however in Doug, Ayun, Baroz and Shishikoh area. In Baroz there are approximately 20 Gujar households, while in Sheshikoh valley Bela, Shirati, Kowas and Asko are villages entirely containing Gujar households. In Rambore valley in Kailash 50 Gujar families have purchased land ownership in the valley bottom, while some have purchased ownership in upland pastures of Kailash valleys. Similarly in Bamborait valley, Gujar have purchased ownership in Gurapun and Ushan (villages lying between Ayun and Bamborait), and Wadus villages. Many among them have now with purchased land ownership. The herd of the transhumant Gujar may contain 3-5 bucks per herd for breeding purposes, while the remaining males are castrated and sold out mainly during autumn. During summer, all the herd members except the lactating cattle and goat are shifted to pastoral area, while the lactating cow and goat graze the pastures in the vicinity of winter residence area.

The average flock size occupying upland pastoral areas in Chorh has been estimated by Ajarhs to be between 100-500 animals with an average of 220 goat per flock. In comparison to, Hindukush pastures in Swat and Chitral larger herds are reported to be visiting the Chorh pastures. The reason might be the bigger pastoral areas with more vegetation limited attitudinal problems and limited political polarization among the landowners and herder groups. The poor families may have 30-60 sheep and goat and 3-6 families may join to form a single large herd sharing their grazing, Qalang and transaction labor, while coming to upland pastoral area. At low land grazing land they separate their animals and independently graze the rangelands leased by them.

The average herd size occupying Chorh region valley bottom pastures as estimated by Gujar is 22 cattle and buffaloes. It has been reported to vary between 12-60 cattle and buffaloes. The Gujar flocks may also have a variable number of goat and sheep. In general, a herd may generally contain 40% cattle, 35% buffaloes and 25% sheep and goat. In comparison to, Hindukush pastures in Swat and Chitral larger herds are reported to be visiting the Chorh pastures. The reason might be the bigger pastoral areas with more vegetation, low Qalang rates, limited attitudinal problems and limited political polarization among the landowners and herder groups. The poor families may have 5-10 cattle and buffaloes and many sister families may join to form a single large herd sharing their grazing, Qalang and transaction labor, while coming to upland pastoral area. At low land grazing land they separate their animals and independently graze the rangelands leased by them. Many Gujar coming from Alai also bring the non-lactating herd members of the landowners with reciprocal benefits given to him in Qalang at upland pastures.

Apart from more than 120 mobile flocks owned by Ajarh coming from Buner and Shangla for summer grazing, Kohistan district contain 169357 cattle, 36403 buffaloes, 277539 sheep and 786242 goat (Livestock census 1996). Almost all the livestock except buffalo do different degree of transhumance. The report reveals that 9338 households reported sheep, 21778 households reported goat, 20490 households reported cattle, 8770 household reported buffaloes, and 16208 households reported asses in their herds. Eighty four percent of the households reporting cattle contains 3-15 cattle. Eighty eight percent of the households reporting buffalo contain 1-6 buffaloes. Eighty-four percent of the households reporting sheep have less than 50 sheep.
Seventy-percent household reporting goats have 6-50 and 20% households have 50-350 goat in their flock. Approximately 90-92% of the total households residing in Kohistan has cattle and or goat while 35-37% households have buffaloes and or sheep. The average flock size occupying upland pastoral areas in Dubair and Kandia valleys have been estimated by Ajarhs to be between 100-500 animals with an average of 220 goat per flock. The poor families may have 30-60 goat and 3-6 families may join to form a single large herd sharing their grazing, Qalang and transaction labor, while coming to upland pastoral area. At low land grazing land they separate their animals and independently graze the rangelands leased by them.

The summer station of Livestock Research Station Jaba during 2002 has counted the number of herds/flocks coming to Naran pastures situated beyond Naran to be 2690 with an average number of 110 animals per herd/flock. This means that a total of 295900 cattle, buffalo, sheep, goat and equines occupy the area during summer. The maximum number per herd/flock has been reported to be 400 animals. These herds/flocks include 1580 sheep flocks, 470 goat flocks, and 643 sheep/goat mixed flocks, 423 Afghani bulkhi sheep flocks and 335 cattle/buffalo flocks. The average numbers of animals per pastoral family have been estimated to be seventy. In many situations, 3-6 families may join to form a single large herd sharing their grazing, Qalang and transaction labor, while coming to upland pastoral area. At low land grazing land they separate their animals and independently graze the rangelands leased by them. The average herd size occupying Naran valley bottom pastures as estimated by Gujars is 22 cattle and buffaloes. It has been reported to vary between 12-60 cattle and buffaloes. The Gujars flocks may also have a variable number of goat and sheep. In general, a herd may generally contain 40% cattle, 35% buffaloes and 25% sheep and goat. The poor families may have 5-10 cattle and buffaloes and many sister families may join to form a single large herd sharing their grazing, Qalang and transaction labor, while coming to upland pastoral area. At low land grazing land they separate their animals and independently graze the rangelands leased by them. Many Gujars coming from Alai also bring the non-lactating herd members of the landowners with reciprocal benefits given to him in Qalang at upland pastures and low land grazing areas. The larger number of herds/flocks visiting Naran pastures may be due the relatively bigger pastoral area. Another important finding was that due to tension on control line in Neelum valley the pastoral movement between Deosai pastures in Northern Area during summer and Mirpur/Mandi Bahauddin during winter is also through Naran. Approximately 1200 herds/flocks have crossed Noori Top in Naran to Deosai during 2002. Normally these herds/flocks travel through Muzaffar Abad and Neelum valley.

Some Ajars are specifically sheep or goat producers, while the others may have a variable composition. The percentage of different species in the flock primarily depends upon the accessibility of a flock owner to an environment/topographic region during different season. Th specifically sheep or goat flock owners are principally transhumant and have insured access to specified winter, summer and transaction regions. Although some principal transhumant may shift between sheep and goat dominant flocks, while depending on shrubby winter grazing lands. Hence they may shift to grass/herb consuming sheep, when goat reduces the shrub dominance and vice versa, thereby maintaining the diversity of vegetation and resilience potential of the rangelands through strategic flock management. The nomadic flock owners commonly continuously changes his flock composition depending on the ecological provision, where can find some grazing.

According to a report (Leede et al, 1997) after state merger (1969) the sheep and goat flock size per family in Swat valley has reduced from 340 animals to 140 animals, while in Buner it has reduced from 200 to 140 animals. According to IUCN (1998) the average per transhumant and nomads family flock size is 110 including the flocks in southern districts. According to census
reports (Livestock Census 1986 and 1996) the total reduction in sheep and goat population in Swat and Dir valleys has been reported at an annual rate of 3.6%. This is due to reduced grazing area caused by communal land distribution, cropping extension to marginal lands and closure of rangelands for afforestation.

The males not selected for breeding are sold earlier, and are followed by aging females. One to three breeding rams/bucks are left with different flocks depending on the flock size. Hence during spring (the lambing season) lambs and kids are numerous, while during winter pregnant females may be more dominant. During summer, the flock usually expands, while during winter it generally squeezes. Twice a year pregnancy is rare and twinning is more common with goats. The reason might be, for goat comparatively abundant feed supply from scrublands remain available during winter.

In other areas in general and Chitral in particular the young males not selected for breeding are usually castrated and are the preferred one for slaughter during festivals and occasion of sorrow and death. The aging females are mostly sold out to butchers. One to three breeding rams/bucks are left with different flocks depending on the flock size. Hence during spring (the lambing season) lambs and kids are numerous, while during winter pregnant females may be more dominant. During summer, the flock usually expands, while during winter it generally squeezes. Twice a year pregnancy and twinning is more common with sheep. However the size of native sheep is many times smaller than goat, while wool is much important for woolen handicrafts than mutton. Sheep also produce only nominal milk as compared to goat that provides most of the milk for family persistent requirements.

The herd composition varies during different seasons. During fall and before the onset of winter the culling in flock is carried out and the less important herd members are sold out. The reason for such sale is:

1. To reduce the flock/herd size to be able to carry it through the subsequent winter scarcity period.
2. To reduce the risk of recurrent exposure of the flock/herd to epidemics that are more common during winter
3. To arrange for money to purchase enough household utilities to pass the family through the winter
4. To arrange the money for festivities commonly arrange before the onset of winter.

Some Ajars are specifically goat producers, while the others may have a variable number of sheep. The goat flocks are dominant among the visitors from Kaladaka predominantly a scrub region with relatively steep topography. On the other hand the visitors from Potohar may have large number of sheep in their flocks. Although some principal transhumant may shift between sheep and goat dominant flocks, while depending on shrubby winter grazing lands. Hence they may shift to grass/herb consuming sheep, when goat reduces the shrub dominance and vice versa, thereby maintaining the diversity of vegetation and resilience potential of the rangelands through strategic flock management. The nomadic flock owners commonly continuously changes his flock composition depending on the ecological provision, where they can find some grazing.

The herds of non-owner local Gujars contain in general contain more livestock than the landowner herd. The larger herds are accompanied with more family members, while travelling to upland pastures and hence contain more equines to carry load during transaction. The availability of watch dogs with local transhumant herds is comparatively less, however watch dogs are common with the non-local Ajarhs travelling longer distances. The poor families may have 2-5 cattle and 5-15 goat and they traditionally visit the upland pasture to avoid exposure to hot
climate down the valley. The transhumance in Kohistan is in general viewed as a way of life than a compulsion for feed and fodder for livestock. In general, the entire family migrates hence all lactating and non-lactating herd members are included in the transhumant herds.

Watch dogs are indispensable to protect the flock from wild carnivores and thieves. The percentage of different species in the flock primarily depends upon the accessibility of a flock owner to an environment/topographic region during different season and particularly during winter. The pastoral groups include Transhumant, semi-nomadic and nomadic pastoral groups. The herd/flock composition of transhumant and semi-nomadic groups reveals limited yearly variation, however nomadic flock owners with the exception of Afghani nomads commonly continuously changes his flock composition depending on the ecological provision, where they can find some grazing.

Social and political institutions of pastoral groups

The following table indicate that landowner Kohistani retains nucleated families longer than nomadic and transhumant pastoral (Khaksar, 1999). The nucleated families in landowner pastoral group may be due to the need for stronger families in a tribal environment to guard the possession of the communal resource, on which they usually seldom subsist. On the other hand the nomadic and transhumant herders have sheep and goat flocks in possession, that require constant care and family labor inputs, and can easily divided into smaller flocks for subsequent growth. Furthermore the nomads have to occupy small houses on lease from the landowners at both up and lowlands that can hardly accommodate nucleated families.

<table>
<thead>
<tr>
<th>No. of Family members</th>
<th>Kohistani landowner Pastorals</th>
<th>Semi-nomadic Pastorals</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 and less than 5</td>
<td>20 %</td>
<td>16 %</td>
</tr>
<tr>
<td>6 to 8</td>
<td>26 %</td>
<td>50 %</td>
</tr>
<tr>
<td>9 to 11</td>
<td>32 %</td>
<td>20 %</td>
</tr>
<tr>
<td>12 to 14</td>
<td>14 %</td>
<td>08 %</td>
</tr>
<tr>
<td>15 and more than 15</td>
<td>08 %</td>
<td>06 %</td>
</tr>
</tbody>
</table>

The small proportions of nomads and transhumant pastoral groups with extended families are usually those having some purchased ownership at lowland rain-fed areas during last 30 years. However even after separation the nomad/transhumant pastoral groups retain closer links, and have greater welfare association with one another. The nomads are much prone to different vulnerabilities and shocks, hence in need of greater association. The constant threat of being marginalize by different powerful social groups as well as external institutions they desire more social integrity, however their constant/frequent mobility hinders their stronger political organization to evolve in the due course of time. Non-pastoral people, with pastoral ethnic background run the available political institutions within nomads/transhumant pastoral groups for their personal vested interests and they never remain interested in the professional issues of pastoral people.

During early seventies, when the previous general social order in the region was shaken and the marginal social segments claimed the ownership of the communal lands in their possession. The Gujars of Malakand also established a united political forum under the leadership of Zarin Gujar of Ckakdara. Zarin Gujar was a practicing agriculturist and timber merchant with a transhumant
background. This political forum was named Anjuman-I-Gujran. The forum also contested elections and provided tough competition to the other contesting parties. Later the Anjuman got affiliated with Pakistan Peoples Party. During early nineties this forum give birth to another fraction termed Gujar Qaumi Tehrik, headed by Shahzad Gujar, because of political dispute. Shahzad Gujar is a local businessman running a car bargain center. His main advice to the Gujar community was that they must abandon their ancestral profession of livestock production and adopt business. The influence of Shazad Gujar was limited to Swat district. In the mean time another politically motivated Gujar and a purchased landowner Fanoos Gujar organized another political movement in the name of Pakistan Awami Tehrik. All these political groups contested every election, however no one among these groups succeeded in obtaining any seat in provincial or national assembly. The verbal policies of these small political fractions are aggressive toward the landowner, but till now they have only rarely revolted against the landowners. Due to the repeated failure of such ethnic political groups in general elections, many of the localized herder groups cluster around other political forces to secure their interests in multi-ethnic local society. During local bodies’ elections, however sedentary pastoralors have succeeded in obtaining approximately one third to one fifth seats of different categories of seats in different regions. They have, however, never adopted a unified stand on their pastoral issues. The reason is that, few if any among them are transhumant/nomadic pastoralors due to their mobile nature and most are sedentary dairy or beef cattle herder Gujars. Their political issues of sedentary pastoralors are entirely different from mobile pastoral groups. Furthermore, the sedentary pastoral groups mostly work for obtaining facilities like road and water supply for their marginal settlements.

During 1996, the nomadic and transhumant herders established their independent welfare society in the name of Nomadic Grazers Welfare Association to work with livestock department to improve the health of their livestock. The association also worked on improving the wool marketing system and organized the pastoralors to resist the closure of their winter grazing lands through afforestation. The association remained active for four subsequent years, however when the pace of afforestation slowed down, and their preliminary marketing problem got resolved, it also went to dormancy.

The Jirga of family heads is transitionally constituted the fuse disputes among different pastoral families, while Jirga for inter-clan disputes comprise of clan elders mostly excluding those of the quarreling families or factions. The families are patri-lateral in nature and father mostly monopolizes the decision about the wedding of daughter. In searching the wife for son, however the say of mother is also given equal importance. The monetary control of the household remains entirely with fathers and sometime even grand father. After family fragmentation some of the resources are kept common with the grand father, that usually strengthen inter family association. As the nomadic/transhumant pastoral groups are likely to face frequent shocks, hence they have established a strong welfare mechanism. For example, when a herder lose his flock due to some fatal epidemics, the remaining herders in the community donate one sheep or goat per flock, so that the affected herder may have comparable flock to his original flock shortly after the event. Hence, the community shares the impact of per herder shock. For other shocks their exists comparable welfare systems. In addition, the pastoral community has the tradition that no herder will take revenge from another herder during mobility among summer and winter grazing areas. The occasion of sorrow among pastoral communities is more heavily participated than the common sedentary landowner groups. This is despite the weak inter-community links, however when one herder is aware about an event of sorrow, he is obliged to inform as many other herders as he can. The weekly livestock markets are the main exchange centers of communal information.

Family labor distribution
The traditional pastoral activities are stratified along age, gender and ethnic lines. A house is the basic unit of economic and social life, while household members maintaining it as an independent economic unit. Its members work together, pool their income, may cook jointly and possess a formal male head. Female equally shares the workload in pastoral families. Livestock management and feeding, weed thinning, manure spreading and forage harvests are shared or predominantly carried out by female farmers. She also helps in sowing, harvesting and threshing of subsistence crops. Among poor pastoral families she arranges the firewood and makes dung cakes for subsequent fuel use. She does all the cooking, cleaning, sewing, washing and house maintenance. With increasing overseas and internal migration of workable male youth, women are overburdened as well as empowered particularly in sedentary pastoral societies (Inam-ur-Rahim, 2002). Different pastoral systems are evolutionary adaptation to provision of occupied ecological niche.

Based upon different farming activities, the year has been traditionally divided into six seasons including spring, dry summer, and wet summer, harvesting or early autumn, storage or late autumn and winter. In different seasons different pastoral production and marketing activities proceed. In general dry summer and late autumn are the seasons for migration to and from upland pastures. The male member like other local communal groups do all the activities outside the household, while female do all the indoor activities. The general trends in the pastoral system are that in addition to pastoral activities, there is small-scale lowland and or upland agriculture ranging from staple to cash crops. Furthermore, the young male migrate to the mega-cities for daily wage labor. Also, the different pastoral groups practicing different types of pastoral occupations have different activity calendars. The sedentary and semi-transhumant groups in general have relatively more involvement in staple production. Also at different ecological niches the outputs from natural resource base quantitatively and qualitatively differ, affecting family labor allocation patterns.

Generally, the local pastoral societies are patriarchal in nature and character. In the family the husband and father has the authority and controls the social intercourse of the family members. Male controls all the property and may act physically to enforce his authority. Women neither can act as legal individual nor she controls any productive resource and the family with more sons is perceived to be more powerful. The relation between man and woman never remain consistent and with the passage of time, the woman gradually obtains power. Her position becomes stronger with her sons, an array of daughter in laws to supervise and control. Men will often seek the advice of their shrewd mothers. Strong willed wives dominate many powerful older men in their homes (Lindholm, 1996). The main role of the female folk however, remains to be maintenance of family institution. Within the limits prescribed by the customs, most women direct the substantial domestic affairs of their men and play significant role in arranging marriages and family alliances (Ahmad, 1980).

In general, the female folks equally share the workload. The milking of cattle, livestock product processing, caring for diseased herd member, intensive feeding of herd member, collection of water from spring, fuel wood collection, are the activities almost entirely carried out by female farmers. She collects quality seed for subsequent sowing, watering of livestock and drying of grain after threshing. Sale of livestock, pasturing, drug administration, slaughtering, general financial management of the household, arranging for health care for a family member, purchase of commodities are the general activities solely carried out by the male members. The milking of goat and sheep is however carried out by both male and female family members. Women also spread manure in the field and carry out weed thinning to be used for livestock feeding or cooking as \textit{Saag} for household members. She helps the male members in sowing, harvesting and
threshing of staple crops. She make dung cakes for subsequent fuel use. She carries out all the cooking and cleaning of household. Sewing and cloth washing are the activities exclusively performed by the females. Plastering of the entire house anterior and roof with mud and making extended shelves in the verandah for placing the daily use utensil are the traditional activities exclusively performed by women. She also decorates the rooms and verandah by making different designs with colored clay.

The labor distribution pattern is not only gender specific, but also age specific. The utensil cleaning, water collection, household cleaning are performed by the youngest female members in the household, cooking by middle age group and milk product processing by workable aged female members of the household. Both male and female children facilitate similarly pasturing at gentle slopes. The adult male remains responsible for attending extended family associated activities at celebratory and sorrowful occasions. The adult men also actively participate in community level decision-making process and are authorized to decide on the basis of household. The decision for wedding daughter mostly remains entirely with the father, while for selecting girl for their son, both mother and father remains involved. The well-bodied young males in the family practice the migration for remittances earning. When only male members migrate with the migratory flocks, the to and from movement is accompanied by all adult male members, while leaving with the flock and herds the well-bodied adult male members.

The females in general carry load of household utensils during transaction movement to and from upland pastures. On the way, they are responsible for cooking and caring for the children. During migration, the female travel most distance separately from the main herd particularly in case of sheep and goat flocks (Ajarh families). Ajarh females mostly accompany the few lactating herd members and load carrier equines. While travelling along the cattle-herd (Gujar families) the females mostly accompany the actual migratory herds. With increasing departure of male members for remittances earning during the past three decades, the women are becoming increasingly over burdened as well as empowered in decision-making particularly those from mono-seasonal cropping regions. The variable access of different ethnic groups to different resources also dictates variable livelihood styles. Much more is expected from little girl than little boys in terms of self-development and ability to work hard. Girls readily learn cooking, cloth washing, care of babies and other household work. Boys on the other hand tend to remain babies for much longer being cared by their mothers and older sisters like a little prince.

There are also some exceptions to the general family labor-distribution pattern, among pastoral families. For example in Arkari region of Chitral sending livestock for grazing early in the morning is entirely a female activity. Livestock female farmers accompany herd from the residence to different grazing niches on daily basis and leave the herd for pasturing. On return, she cooks the food and process livestock products. When the livestock herd return in the evening she counts the herd and informs the male members, if any member is missing. In Chitral, during winter season, when no extensive pasturing is possible, the female farmers clean the wool and transform it into threads. The male members subsequently make the woolen cloth through handlooms. When the grinding mill is near the residence, the delivery of grain for processing is also a female activity, otherwise male members facilitate the transaction himself or through the donkey. During spring season, she collects edible natural vegetable herbs, for drying and storage for winter. During gradual upward pastoral movement with livestock herd during summer, each family usually spare one male and one female for three months, while the rest of the family stay at the main residence. In Chitral spring is the season of celebration like arranging wedding ceremonies, while in other regions late autumn is mostly the season for such occasions.
In Swat, Dir and Western bank of Indus Kohistan female farmer activity is reduced to in-residence cooking, household and livestock management activities. The female farmers also facilitate stubbling and hoeing in the surrounding fields and help in hay harvest for winter storage. On eastern bank of Indus Kohistan, and Kaghan however, the female external movements are much relaxed and carry out additional outside activities like fuel wood collection, and livestock pasturing.

**Poverty analysis**

According to a study (Leede et al., 1997) for the average transhumant and nomadic family 20 sheep/goat is the minimum flock size needed to marginally sustain a family (equal to a daily laborer income of Rs. 70/-). In general, the powerful are concentrated on the fertile niches mostly in valley bottom, while the pastoral groups occupy the low yielding, harsh and mostly sloping areas. Compared To Wali time, in Swat valley 15% Ajarh families left the job during Bhutto time and 54% have shifted to other occupations till 1997. In Buner 1%, Ajarhs left the job during Bhutto time and 41% have shifted to other occupations till 1997. Alternative jobs are mostly found in agriculture and daily wage labor. The change of job has increased after 1980.

According to Khaksar (1999) among the Swat Kohistani-landowner, pastoral groups 24% depended on agriculture as their main source of income against 2% nomads/transhumant pastorals. The dependency on forest as a main source of livelihood was 12% among the Kohistani landowner pastoral groups and 8% among nomads/transhumant pastorals. The dependency on livestock as a main source of livelihood was 36% among the Kohistani landowner pastoral groups and 80% among nomads/transhumant pastorals. The dependency on remittances as a main source of livelihood was 12% among the Kohistani landowner pastoral groups and 6% among nomads/transhumant pastorals. The dependency on other activities like trade and business etc., as a main source of livelihood was 16% among the Kohistani landowner pastoral groups and 4% among nomads/transhumant pastorals. In Naran the dependency of non-owner pastoral is gradually diverting to cash crops. While in Swat and Dir Kohistan landowner pastoral groups gradually marginalize the non-owner pastorals groups during the process of extending cropping to the potential pastoral areas. In Chitral, Chorh and Indus Kohistan the shift in dependency from livestock to cash crops is much slower and in remote areas negligible. In all pastoral regions the trends of increasing dependency on remittances can however, be generalized in intensity but not in occupation and destination. Depending on the cost of migration, the landowner pastoral groups generally utilize potentially high earning opportunities compared to the non-owner pastoral groups.

Among the Swat Kohistan landowner pastoral groups 38% families were absolutely illiterate, 20% had family member with schooling up to primary level, 16% up to middle level, 14% up to metric level, and 12% families contained members with intermediate and higher literacy level. Among the nomads/transhumant pastorals 86% families were illiterate, 10% had family member with schooling up to primary level, and 4% up to middle level. Such situation is however can hardly be generalized. Hence, in Arkari and Goleen in Chitral the literacy ratio among the pastoral owner users is high due to efforts of Agha Khan Rural Support Program for increasing literacy. However, the literacy ratio among the non-owner user is much lower than that prevalent in Swat Kohistan. In Kailash valley and Indus Kohistan non-owner nomadic/transhumant pastoral groups, still school going children can hardly be traced. The condition of the non-owner pastoral groups visiting Chorh and Naran pastures is however comparable to the non-owner pastoral users of Swat Kohistan.
Among pastoral families, belonging to both landowner and non-owner user groups more sons in the family is considered a strong sign of changing economic conditions. More sons are viewed as present or future earning resources for the family. In every pastoral society examples are frequently put forth of changing economic conditions due to loss or availability of young male in a family and more male members as a pre-requisite for prosperity is considered like a universal truth. In general the potentially motivated young males are sent for remittances earning as a part of family survival strategy, while the less motivated other age groups are left for livestock and cropping at home.

The consumption level of all pastoral groups in general and non-owner pastoral groups in particular have remained at the least necessary for survival. Purchase of single pair of clothes and plastic shoes per person per year is a routine of well to do pastoral groups. The poor pastoral groups may spend many years in one pair of cloth and shoes or may depend on the used clothes given by the other clan members free of cost. Particularly among the non-owner pastoral groups, the livestock and humans mostly occupy the same residence. The residences are made of raw stone masonry with or without mud plaster only to the anterior side of the wall. The water source remains distant particularly at lowland winter areas and the females are obliged to bring water for the family and in many cases for livestock. The fuel for cooking is collected from the surrounding hillside on daily basis, or dung cakes dried for the purpose are used. The routine food comprises of milk/milk products, cooked edible herb and corn breads. Minimum unbreakable lead utensils, once purchased are used for dozens of years. Apart from clothing and utensils, routine items purchased from the market include common salt and raw sugar, while the rest are arranged by personal labor from the household or neighborhood resources. For lighting, the oily roots are the common source, however the trend is the use of simple kerosene lamps or casually lantrine.

The landowner pastoral groups are however at much advantage. For example in many regions they have well-built houses, many modern day household accessories, like radio, television, rifle, many pair of clothes and expanded consumption choices. They and their livestock reside in separate rooms. They have shifted from the use of simple fuel to the use of close circuit heating system. The livelihood is however, not uniform in different pastoral systems. The regions with expanding cash crops and tourism like Kalam, Utrore, Gabral and Naran have in general higher consumption levels, while those of Indus Kohistan have the least consumption levels.

Within every pastoral system, among the owner-users and non-owner user pastoral groups there are different levels of poverty levels. The landowner also include absent landlords like the Syeds of Kaghan valley or Khans of Alai, who are only concerned with the lease money and have no direct dependence on the owned pastures for their livelihood. Another less-dependent owners group is rapidly shifting his dependence to tourism and cash crops like the residents of Kalam, Utrore and Gabral. The small landowners that are themselves dependent on livestock pasturing include the occupants of Kailash, Arkari, Goleen (Chitral), Mahodand and Ushu in Swat, Indus Kohistan residents, and Madakhel residing in upper parts of Alai. While excluding the non-dependent pasture owners, the poverty analysis of the remaining owner and non-owner pastoral groups can be generalized.

Among the non-owner Ajarhs pastoral groups visiting Swat Kohistan, the well off were reported to be those with a flock of 200-400 sheep or goat. They may also own 1-2 acres purchased land in winter areas. They possess their own residence with 15-20 working male in the extended joint family. Such families have more males for remittances earning, many of them in the Middle East and many of them have some schooling. The mediocre families have 100-150 sheep or goat in their flock, with one or less than one acre purchased land. Majority of mediocre families has their own house in winter areas with 8-12 working male in the extended joint family. Such families
have more males for remittances earning; many of them in mega-cities inside the country and few of them have some schooling. The poor families are those with 10-30 sheep or goat in their flock and are obliged to bring the flock of well off pastoral groups on payment. They have no purchased land or residence. They do wage labor in local cities. They have limited working males and more children to feed. They however hope to go to the mediocre class, once the children are grown up. The poorest families are those having one or two cattle. They have no land or house. These families have 0-2 working males and are the recipients of grants from other well off families. At low land, they depend on sale of grasses or fuel wood and daily wage labor. On many occasion the family can only afford food once a day and some time they depend on begging. According to the estimates of non-owner pastoral groups with sheep and goat flocks, they may have 5% well off, 35% mediocre group, 50% poor families and 10% poorest families.

The owner users remain partly pastorals and partly depend upon non-pastoral activities including staple agriculture, remittances, trade and cash crops. The dependency is directly related to the availability of other options. The owner users in Indus Kohistan principally depend on livestock and agriculture and they have large differences on the basis of ownership of natural resources as they are scattered through a large territory. On the other hand the owner users of Arkari valley in Chitral are limited to a smaller territory and can be better understood. The estimates of economic level, provided by the residents of Arkari valley indicated that 5% of the families residing in the valley could be considered well off, 35% mediocre families and 60% poor families.

Among the owner-user pastoral group residing in Arkari valley the indicator of well off is the presence of brick made cemented house, completely covered with CGI sheets. The house contains well-built guestroom and a separate bathroom. The well off also own 1-5 acres land, capable of producing staple for family subsistence. They have a family member capable of obtaining contract from government for local level construction. They may own 200 goat or 20-30 cow. The milk, yogurt, cheese and meat are abundantly available to the household. They have access to different bank loan and can sell potato and Medicago hay to other to earn surplus money. The family members have good clothes and shoes and are able to purchase jeep. They have more earning male members and can afford to carry a sick family member to hospital in Chitral and even Peshawar. They can provide higher education to their children in Chitral and can support other villagers during crises. The mediocre families in Arkari valley are indicated by availability of smaller house for the family compared to the well off, partly cemented and partly covered with CGI sheets. The households also contain a guesthouse and a bathroom. These families have a remittance-earning member and own up to one-acre cultivable land. They have 4-5 cattle and 20-30 sheep/goat and they can afford consumption of purchased food like rice. These families can subsist without lending money from others and are sometimes able to support others during crises. They can purchase reasonable clothes and shoes for their children, however they can not afford to purchase jeep. They can afford to educate their children up to metric level and can treat a sick household member through lend money. The poor families are poor because they have limited earning male members. They have sold most of their land to provide for livelihood and are obliged to reside in stone made muddy house, with no bathroom and guestroom. They desire support of others for survival. They may or may not have a cow or 2-3 sheep or goat. They are usually over burdened by loans and can not afford to provide education to their children and the children depends on others for provision of used clothes. They mostly subsist on eating corn bread taken with tea or boiled wild herbs and can occasionally have sufficient food. Their occasion of sorrow is facilitated by the well off villagers and they can seldom afford medicine purchase.

Relations of the pastorals with different external institutions
Different pastoral groups have differential dependency and different issues, hence variably related to different external institutions. The Kohistani semi-transhumant pastoral group has now shifted its primary dependence toward cash crops and tourism, hence exposed to a variety of external institutions during the past 30 years. There gradual decreasing direct dependence on pasture and livestock have not decreased their association with pasture related institutions being the pasture owners. In spite, they are now looking forward to the distribution of communal pastures and bringing the gentle pastoral strips under cash crops. This is statement is more valid for the Kohistanis of Utrone and Gujars of Gabral. The Kalam Kohistanis have become more dependent on tourism related services, while for Matiltan Kohistanis limited gentle area is available for conversion into cropped area. The semi-transhumant herders in down areas have shifted to mixed market dependency particularly the remittances with local mixed sedentary farming of corn and or wheat and livestock. The transhumant/nomadic pastoral groups are living in a relative isolation and have links with limited number of external institutions. In this section, relation of transhumant/nomadic pastoral groups with different institutions is briefly discussed.

Social institutions, external to these pastoral groups, with whom pastoral groups interact, are principally those of the pasture owners. The time of intervention is mainly before occupation of the grazing lands during summer and winter. During summer, yearly lease agreement is finalized mainly with Kohistani and Pukhtun pasture owners and rarely with Gujar pasture owners. A month or so before coming to upland pastures, the lease negotiators among the pastoral groups visit the area to deal with the communal heads, usually representing elders of different subgroups having ownership rights in a particular pastoral area. Those negotiating from the Ajar side are called Malik. The Malik after reaching an agreement would subsequently be able to graze his flock without any share in lease money for the whole pastoral area. He would also be responsible for collecting individual flock owner share to provide it to the pasture owners committee. The upland pasture owners, while visiting the pastoral areas can additionally snatch a buck or ram from any flock he like, without any compensation. At low land, the leasing pattern is similar to the upland pasture, however only casually annual renewal is necessary and the last year pastoral lease usually continues, until a new agreement is absolutely needed. Also, the manure heap is obtained for transport to the cropland and is much valued rather than snatching a buck or ram for slaughter. The pastoral groups at both upland and lowland are generally screwed to subordinate social position mainly because of their limited bargaining and political power.

As transhumant/nomadic pastoral groups depend for their livelihood on livestock, they have formal or informal links to the livestock and dairy development department. Livestock department has a network of hospitals and dispensaries throughout the region, where veterinary graduates and assistants are likely to provide health care services to livestock. During early sixties to facilitate the production of fine wool, Jaba sheep research station was created. The station used to distribute fine wool Ramboillete breed rams free of cost among transhumant sheep flock owners of Malakand and Hazara region. Each year 10-20 rams were distributed in each valley. The distribution and long term breeding program has tremendously transformed the characteristics of the native, gray colored, course wool breed locally known as Irrhai. Now the wool production has increased qualitatively and quantitatively and can be used in the modern woolen industry. The body size and growth rate of the crossbred sheep is not less than twice of the native breed. However, the crossbred animals are less resistant to diseases, less efficiently utilizes the local difficult hilly terrain and requires additional nutritional inputs for optimum performance. An additional negative factor is that their more closure grazing habits are not as much environment friendly as that of the native breed. Another important policy implication was that the department was not sufficiently equipped to effectively follow the breeding program in order to avoid the accumulation of recessive breeding characters.
During 1978, the Government of NWFP launched a five years Livestock Extension Project in Swat, Dir and Kaghan valleys. The aim was to provide veterinary curative and preventive support to the mobile pastoral groups particularly the nomadic, semi-nomadic and transhumant through the establishment of mobile veterinary camps in summer and winter pastoral areas as well as on the trekking routes and training of Auxiliary workers among pastoral groups. This was followed by an outbreak of Rinderpest disease causing more than one Lac causalities of small and large ruminants belonging to pastoral groups. The project while in developmental phase contributed significantly by raising awareness among pastoral groups about preventive and curative measures. After 1984, the program was converted to non-developmental cadre, where after all the mobility and supervisory facilities were withdrawn. Such withdrawal rendered the mobile camps useless for the pastoral groups. The remaining curative and preventive facilities available in veterinary hospital and dispensaries are aimed to provide services to sedentary livestock farmers.

The mechanism of service provision is such that being included in the economic activity cadre the livestock department is supposed to provide cash earning to the provincial government. The farmer coming to the veterinary institutions should purchase the veterinary medicines from the market and service charges should be procured from the farmer at the rate of Rs. 3/- per animal for the prescription. The mechanism may work in the urban localities, however in rural and mountainous areas the veterinary drug shops are not always available. There is almost absolute lack of quality control for veterinary medicines in the market and the quackery in livestock sector is at its bloom. The irrational use of antibiotics and steroids is not only creating drug resistance, but also have negative consequences for the meat and milk consuming population. Furthermore, the department of livestock and dairy development is treatment oriented. They never consider it important to plan at a higher level of social organization even among sedentary farmers. Hence, the peri-urban commercial dairy producers are never considered as a special target group involved in commercial level livestock production. Their main emphasis remains on the subsistence level rural livestock farmer for whom livestock production is a secondary activity. The pastoral groups have however identified different serving veterinarians as consultants. Even when they face a problem even at remote upland pastures, they use to travel the long distance and come to get advice from the consultants. Livestock department can facilitate the pastoral groups not only in herd health, but also in product processing and marketing.

The semi-transhumant Kohistanis have remained closely associated with Swiss supported Kalam Integrated Development Project and that has facilitated their shift from pastoral system to market economy. Being forest owners (as they claim) they are closely associated with forest department, forest development corporation and forest contractors. In forest department, the semi-nomadic and transhumant pastoral only knows the forest guard as “Gaat”. He only knows him as a person, who has the power and authority to catch and snatch an animal from his flock, who has the authority to fine him and can hinder his to and from movement of upland pasture. He also knows to the extent that it is the Gaat, who is responsible for afforestation of the hillside previously grazed by his flock. The pastorals however, never know how to converse with him and at what level. The forest department primarily being tree oriented similarly considers the pastoral as the destroyer of natural resources, without considering their due role in natural resource management and maintaining ecological bio diversity.

Agriculture department on the basis of their sectoral approach considers it appropriate to promote cash crops on marginal lands of fragile ecosystem without considering its impact on environment. The off-season vegetable promotion in Kalam, Naran, and Dir Kohistan through the assistance of different donors work to facilitate cropping and tilling of fragile sloping lands through research stations in different pastoral regions. The department intends to further strengthen this sector. Once the change toward market economy is initiated, its reversal become extremely difficult. The
need is a Trans-disciplinary approach considering all aspect of sustainable development in an environment friendly way. At the market, different many agricultural products other than staples have open market structure. For the livestock, the inputs like veterinary drugs and feed ingredients have free pricing structure, while for livestock products like milk and meat the market is regulated for the benefit of urban population.

District administration and Police do not admit the guarantee of mobile pastoral groups. The pastoral herder is thus obliged to search for the guarantee of a landowner when required in case of conflict. Livestock herd is not considered under the rules an asset for guarantee. On the other hand, livestock in most situations remain the sole asset of these people. Such mechanism compels the marginal pastoral herder to keep good relation with landowner group even if his behavior remain cruel toward him.

The semi-transhumant Kohistani of Kalam possess all the modern day facilities including telephone, television, radio, tape recorder, jeep and Klashinkov. He is now depending on all modern day utilities. To compete with each other’s in possession of these utilities, they are continuously selling their lands to the external investors in hotel industry. Most of them after such land sale are ending as servants in these hotels. The greater proportion of their roadside land is now in the possession of external investors. The Kohistanis of Utrore are however are trying to compete with the Kalam people through earning from cash crops. The hotel industry has limited extension to Utrore, hence the people of Utrore as well as Gabral are still in possession of their lands. The semi-transhumant of Ushu/Matiltan have limited alternatives, hence they still practice transhumance to the valley bottom of Mahodand pastures. The nomadic and transhumant pastoral groups have limited modern day requirements. They may have a watch, plastic shoes replacing the tied leather around the feet, a Kerosene oil lamp replacing the burning oily root of pines, lead utensils replacing the clay utensils, and a pair or two per person, mixed cotton textile clothes replacing locally woven cotton or woolen clothes. They purchase these items from the weekly stalls at livestock market place.

Credit institutions provide credit against the guarantee of assets like factory, land ownership, while livestock possession is not considered as an asset worth guarantee for obtaining credit. Fortunately livestock itself is viewed as a banking system for the entire rural population weather sedentary or mobile in nature maintaining its capital value and can be readily exchanged. If arrangements for herd/flock insurance are worked out, these can make the mobile pastoral system more dependable for investment.

Forestry reforms process and pastoral groups

The newly evolved forest policy like the previous sectoral approach has limited space for the mobile pastoral groups. All included about mobile pastoral herders is how many fines have to be imposed if an animal owned by a pastoral enter a protected forest and how the local landowners can be empowered to impose such legislation. Many grazing lands have been closed for conservation purposes that worked to facilitate overcrowding on the remaining pasturelands. Many of the traditional trekking routes and grazing lands used during transaction have been closed for afforestation during Social Forestry Projects and the landowners have been convinced to prevent usage by pastoral herds.

The proposed long-term strategy is to bring forest-able lands under forest cover to increase the forest cover in the province. Forest-able lands means any land that is not cultivated and not under forest but is capable of supporting a forest. It includes any land, which the government may by notification in the official gazette, declare to be forest-able land. According to the definitions
provided in the proposed Forest Act, forest produce apart from tree products and by-products include all plants not being trees, wildlife, soil and mines, and standing crops in an area declared to be a forest. The government may by notification in the official gazette regulate or prohibit in any forest or forest-able land over which it has no proprietary rights, or in any Guzara land from the pasturing of cattle (Chapter-V, 17b, Draft Forestry Act) apart from other activities. There are no definitions provided for rangelands and pasturelands, despite the fact that these are the dominant land uses in the province, particularly by the marginal and powerless social segments. These all have been included in the forest-able lands. In addition, the forest officials will work like a force to impose the decisions taken in this connection.

The proposed forest policy presupposes that any land that is not cropped (including rangelands, pastures, graveyards, roadside and canal sides) should be covered with trees. They ignore the social relations in respect of natural resource use and their claim of control over land resources significantly differs from on the ground situation. Their integrated approach does not mean the integration of different disciplines covering social, physical and biological spheres, but bringing different land types under the exclusive authority of forest department. Within the social sphere, they only perceive integration with landowners ignoring the potential role of actual resource user in resource conservation. The approach echoes the classical colonial approach that considers the land degradation mainly physical phenomenon and resource users being irresponsible and ignorant. To make the approach participatory, the department plans to negotiate with landowner (absent landlords and owner users), without caring for the subsequent political consequences and enhanced poverty through forced marginalization of non-owner users. They intend to carry out conservation, while refraining from interacting with political forces.

The issue conceived by the owner users in Arkari pastures of Chitral are given as under:

1. Issue of recurrent flooding as the main settlements are situated in the areas exposed to flooding. The semi-arid environment and occasional breaking of glaciers causes over flow of the streams, on which the inhabitants are dependent.
2. Limited fuel wood availability for winter due to the reason that rare natural forest cover has already been vanished and for severe and prolonged winter, the residents are obliged to arrange large quantity of fuel.
3. Drinking water problem due to the reason that springs are far away
4. Gradual deterioration of pasturelands due to increasing livestock to subsist increasing population.
5. The limited irrigation possibilities are compelling the inhabitants to purchase food from the market.
6. Limited opportunities of education and health are conceived when the local compares the region with other areas of Chitral.
7. Limited job opportunities. To feed the growing population above the feeding potential of the local resources, there is increasing tendency to search for non-farm and non-pastoral occupations
8. Wild carnivores pose consistent threat to the grazing animals as well as human population specially when they are prohibited from hunting these animals.

For the owner users of Indus Kohistan, the pastures are usually far away and the pastoral people have to travel for day to reach these pastures. Hence, for these people the limited accessibility become the prime problem. This is followed by the lack of veterinary/health and education services. The vastness of pasture makes the deterioration of pastureland less conceivable by the inhabitants. If accessibility is improved, there might be rapid shift to production of off-season vegetables on fragile marginal lands of upland pastures. For the owner users in Utrore and
Mahodand valley, the prime problem remains the limited irrigation channels, as they are looking to the economic opportunities in cash crop in marginal areas.

**Trekking routes, dynamics of migration and mobility issues**

Trekking routes are centuries old. In general, the lowland pastoral settlements of non-owner users are much scattered in comparison to upland pastures. Most of the pastoral areas in the province are inter-linked. The prevalence of nomadic and semi-nomadic pastoral groups provide the long distance migratory movement a mesh like appearance. If a long distance transhumant non-owner pastoral family moving between Buner lowlands and Utrore upland become dislocated from Utrore upland, it may opt to proceed to Osherai in Dir, Laspur in Chitral, Dubair in Indus Kohistan, Chorh in Alai and even Batakundi in Kaghan. Hence many semi-nomadic pastorals particularly the goat herders of southern Buner may choose to proceed in different combinations on one year to Mahodand (Swat Kohistan) and Laspur (Chitral), while during next year they may decide to proceed to Chorh (Alai, Batagram) and Naran (Kaghan valley, Mansehra).

The ecology of regions between Potohar and Babusar pass, and southern Malakand/Buner and Dadarelli pass is similar at least from pastoral perspective. A pastoral family carefully plans the pastoral destinations. The family look for the density of livestock/area of the proposed destination affecting the availability of forage, the behavior of the landowners, the prevailing peace in the region, the migration environment, the mobility barriers, the \textit{Qalang} rates and family labor availability along with many other factors. Different trekking routes between upland and lowland pastures have been evolved throughout the region. The main trekking routes are given on the annexed trekking route map. There are short span movement prevailing with higher intensity in regions, where pastures are easily accessible to the landowner settlements. The hardly accessible remote areas are predominantly left for non-owners mostly long span pastorals.

In case of blockade to one route, an alternative route usually along main road is adopted. As the pastoral groups entirely depend on grazing, hence utmost important is the availability of foraging spaces at least on twenty different localities along each main lengthy trekking route. This is crucially important for the survival of whole pastoral system. The grazing area availability along the routes is not only important from the point of view to ease pastoral movement. Forages available at upland pastures for optimum performance needs enough time to reach grazable stage. Early arrival may cause directional change in vegetation composition toward non-edible species.

The main hurdles created to the to and fro movement of pastorals is the gradual distribution of the communal lands, their cultivation necessitated by the growing population. Poverty and population growth is complementary and every male child born is perceived as an asset in the form of future earning labor. Closure of grazing land along main trekking routes through afforestation particularly on roadsides is another important barrier detrimental to pastoral system through minimizing the possibility of transaction grazing. In some situations, important crossing points have been closed and pastorals are obliged to travel through a longer alternative route. Many of the traditional trekking routes have been closed due to afforestation activities and privatization of communal land. While travelling to Chorh pastures the traditional route from Haripur to Battal via Bheenghra, Doga, and Jali has been closed due to afforestation activities and the herds are obliged to travel through a longer route through Darband on the bank of river Indus. The trekking route is not only much longer but also hotter and harder leading to many casualties particularly during upward movement. A similar barrier is on the trekking route from Suchan bridge to Chorh pasture, where the afforestation activities at Kopra compels the pastoral groups to adopt a much longer migratory route through Chorkoh pass. Similarly, blocked trekking routes are observed in
the Swat valley through Totano Bandai pass from Adinzai to Nikpikhel and Miankalay pass from Nikpikhel to Matta valley. Many similar trekking route blockades are compelling the pastoral groups to adopt alternative longer routes in Buner, Malakand and Dir valley as well.

Different mobility patterns are differentially adapted in different ecological units. These are mainly based on physical (landforms, soils, hydrology, climate and geomorphology) and socio-political system (class structures, ownership pattern, traditions and social relations of production). Available technology and occupations (feed procurement, management, breeding, off-farm occupations), economic system (market structure and distance, pricing structure, demand for product, requirement for subsistence) and complementarities have their due impact.

In Malakand region before the advent of chemical fertilizers during past times the up and downward movement of transhumant herders was coupled with the dry summer and autumn harvesting seasons. The harvesting seasons varied with increase or decrease in elevation. The gradual movement of herds was spread over a month or more in a manner that the herder used to spend a night with his herd on the productive pieces of land consuming the aftermath of crop harvest while the flock delivered manure to the cropland. The result was that little subsequent manure was required for the field followed by a good crop yield. The landowner in return provided specified quantities of corn flour to the transhumant herder family. This also promoted synergistic relationship between the both social groups that was further strengthened by the reciprocal exchange of gifts by household members. This association has now disrupted due to different reasons. These include decrease dependence of landowners after introduction of chemical fertilizers, political polarization between landowners and users on Afforestation activities and individualization of communal land contributing to lesser availability of grazable area during transaction as well as winter grazing lands. Due to such political polarization, the transhumant herders now spend the night mostly on the road and riverside. At uplands, the extension of commercial vegetable to many previous pastures particularly in Utrore and Gabral areas has similarly reduced the available area for grazing.

Before inception of Swat State due to security problems nomads preferred to visit to pastures on the left side of Indus river (Naran pastures). Although some pastoral groups were able to utilize the pasture in Swat Kohistan, like one Pashan Malak among Ajars has been reported to have good relations with elders of Kohistanis in Utrore and his grandsons now with many flocks still occupy some pastures in Shahibagh area. The remaining two third Ajars visiting Shahibagh are mainly semi-nomadic previously moving between Kaghan valley lower Buner. The Mahodand and Gabral pastures were visited transitionally by different pastoral groups, and probably without paying any formal Qalang. For Daral pastures during State times the Kohistanis of Bahrain received Qalang. However, later they were not able to ensure the collection of Qalang and their grip on pastures gradually loosened. In Naran and Chorh area, the pastoral occupation pattern was already formalized and the settlement in Kaghan valley was complete before the end of the Nineteenth century.

Previously whole family migrated to every pastoral area, however now either partly family or only male members migrate to many pastures. Where the families migrate, they prefer to proceed through vehicles as the flock is obliged to travel day and night due to closure of grazing area surrounding the trekking routes. Many of the trekking routes have already been closed and the flocks at present in majority of situations are obliged to travel through main roads. One of the reason of partial family movement is the adoption of alternative occupations like overseas migration and wage labor and trade in mega-cities as well as locally. Still family migration is more common with nomads than transhumant. The transhumant Ajars visiting Mahodand pastures were almost entirely without families, however in Shahibagh most of the households
migrating included some female family members. The main reason revealed is the difficulty of terrain in Mahodand pastures. *Ajars* visiting Daisan, Loi-Panghalay and Daral mostly bring part of families, however the increasing trend of schooling in children the movement is gradually limiting to male members. For the landowners visiting Shahibagh pastures female family members accompany, while in Daisan the family movement partly prevails. In Mahodand area however the Kohistani migrate with families to the nearby pastures, while at high elevation the families are rarely in company and only two male members remain available with the flock. During to and fro herd migration however, the number of accompanying male members increases to four persons per individual or combined flock. The movement to Kohistan pastures is still in old fashion and entire family migrates with the flock. In Chorh area, partial families visit the nearer pastures, while to the remote pastures only male members migrate. In Naran, the common trend is the migration of part or entire families with the flock. The Afghani herders normally keep their families with themselves, while travelling to and from upland pastures.

In Swat valley during state times, transhumant pastoral groups that used to reside in and around forest and scrublands depended during winter on these areas. They utilized these areas for grazing and browsing, while giving *Usher* (one sheep or goat per flock of 100 or 2-kg butter oil per five cattle or buffaloes to State in the form of Islamic tax) plus nominal amount of *Qalang* to landowners along with manure. In return, they were obliged to care for the forest and catch any one with saw or axe for handing over to State authorities. Only sickle was allowed for pruning and goat for browsing. In a way, the ex-State managed the resource through the social group that depended for their livelihood on it. In other words, we can say that during ex-State *Ajars* and *Gujars* were the custodians of forest resources. Such arrangement also facilitated shift of the *Ajars* and *Gujars* from nomadism to transhumance. In comparison, the pastoral systems in other areas possessed no such formal mechanism.

According to Leede et al., (1997) during Ex-Wali time the Ajarhs were mostly going through the hillside. They used to spent 2-3 months during to and fro movement. Now most of the traditional trekking routes have been closed for afforestation and the Ajarhs are obliged to travel along with their flocks through main road. Trekking stay problem is the other main issue. During ex-Wali time while travelling from Buner the flocks used to stay for a few hours after travelling 10-12 km. They were able to spend 3-4 days at a spot, while grazing their animals in the nearby forest. Now they do not find any place to have rest for an hour or two and they are obliged to travel day and night and may reach the upland pasture with in a week time. Due to blocked traditional trekking routes, plantation along the main road, distribution of communal lands and extension of cropping to marginal areas it is difficult for the *Ajars* and *Gujars* to find forage places to feed the animals during migration and spend the night. Sometime trucks are being used to transport the animals quickly. Use of trucks is however expensive and cannot be afforded by all *Ajars*.

The early arrival at upland pasture is not appropriate, hence the early vegetative growth need some time to reach early bloom stage and store sufficient nutrients in the roots before grazing is feasible. The net result may be the gradual dominance of toxic or non-consumable plant, though such trends have never been properly documented. According to the *Ajars* that *Polygonum* herb, Birch and Willow trees have been deceased during the past 25-35 years. To conserve the upland pasture it would be necessary to prolong the trekking time from low land to upland areas.

One of the main mobility issues is the lack of security during transaction. The goat herders travelling through Shangla Mountains particularly emphasized this issue. They reported frequent robbery, snatching of animals and money on the hillside between Shahpur/Lilaonai and Bishigram Mankyal. According to them the police are either not willing to enter the FIR, and in many situations they have to pay more money and time for obtaining the due justice. While in
transaction with their entire flock, they are also not able to find time proceed to Police Station and provide them with any proof for robbery at far flanged location. The non-acceptance of bail through migratory people compels them to search out any local landowner, hardly prepared to help the unknown migratory flock owner. The forest guards in order to protect the afforested area mostly snatch the migratory herd member and a long procedure for settling the issue is not affordable, while travelling with a hungry herd of livestock with no hope for grazing on the migratory route.

Livestock diseases, preventive and curative measures

The transhumant herders visit the veterinary institutions to get veterinary aid for their livestock mostly during winter. When they proceed to the weekly livestock markets and get some money from the sale of animals, they spent the money either in purchasing food and clothes for the household members, or proceed to veterinary hospital or veterinary drug stores to purchase medicines for their flock. The incidence of infectious outbreak are more common during winter as the under nutrition reduce the resistance power of the flock and the flock become more proven to parasitic infestation and infections. Although during casual severe outbreaks, they may seek veterinary aid during any season. They usually have established links with a particular veterinarian and during emergency, they seek the assistance of that particular person, no matter how far he remains.

The usual practice is that the pastoral very rarely carryout prophylactic vaccination. This may be due to their miser nature or short history of exposure to modern veterinary curative measure. As common in other social segment there is a high trend of self-medication and to save, money there is usually a habitual under dosing. For example, when a Doctor prescribe for providing a drug for 5 days, the herder may immediately stop the drug as soon as the symptoms subsides, say after two days. This is rapidly leading to the development of resistant strains of microorganism and during subsequent outbreak, the cure requires a high generation and more expensive drug. When a herder purchase a medicine prescribed by a veterinary doctor, he keeps the empty bottle and repurchases the same drug when observe similar signs in future. The routinely observed mortality rates due to different infectious diseases have approximate range from 15-35% during different years. The economic loss due to parasites and metabolic diseases may be twice than that due to infectious diseases.

The Pleuro-pnemonia during winter, Entero-toxaemia during pasture changing i.e., spring/autumn, Foot rot and Foot and mouth disease in any season are the routine disease occurring in small ruminants as observed by different veterinarians. Anthrax, Pox, and Black leg during different seasons are the occasional outbreaks faced by small ruminant flocks. Rare occurrence of Rinderpest has also been reported in different areas. The non-infectious mostly parasitic diseases routinely faced by small ruminants include different types of Roundworms, Lungworms, and Warbleflies and the most important is the Liverfluke. In cattle and buffaloes, the infectious diseases observed most commonly include Black leg, Haemorhagic septiceamia, and Foot and Mouth along with occasional occurrence of Three days sickness. The parasitic infestations include Liverfluke, Roundworms, Lungworms, Babasiasis and occasionally Tapeworms. Ecto parasites are like Ticks, Mange and Mites are routinely observed and rarely cared for unless severe infestation is observed. Apart from these different deficiency and metabolic diseases and non-infectious diseases and accidental injuries are routinely observed in individual animals. If the sheep or goat ailment is curable with traditional herbal medicines, or purchased antibiotics mostly Oxytetracycline, these are tried, otherwise slaughtered or sold to the butchers. For breeding rams/bucks, cattle, and buffalo initially the local expertise of quacks is utilized, and subsequently the services of a legal or illegal veterinary practitioner are obtained.
When their occur an outbreak, the initially non-affected flock owners require the services of a religious person to say or right holy verses for the flock (Dam Darood or Taweez) to prevent it from getting the infection.

The pastoral people however never recognize different diseases with the modern names. Their grouping of diseases also differ from the allopathic nomenclature in some cases. Different diseases recognized and prioritized by non-owner sheep and goat herders include:

1. **Rekhay** or profuse diarrhea is considered the most important disease causing 90% mortality in the flock at the eve of an outbreak. It affects both sheep and goat throughout the year. There is no treatment for the disease in traditional or allopathic medicines. The outbreak occurs occasionally.

2. **Kalgee** is the second most important disease and have three subtypes including Rekh/Budhai Kalgee (mainly affecting goat), Topakay Kalgee (mainly affecting sheep) and Da Wachoobi Kalgee (affecting both sheep and goat). The disease has been reported to cause 75% mortality, when it comes. The prevalence is higher than Rekhay. The seasons of occurrence are winter, dry summer and late autumn. There is no treatment for the disease in traditional or allopathic medicines.

3. **Tabbaq** or foot and mouth is the third in importance due to its very high incidence. The mortality after an outbreak may not be more than 15% mainly confined to kids and lambs. The disease occurs throughout the year in any season and affects all type of animals and all age groups and the pregnant animal’s abort after getting infection. There is no treatment for the disease in traditional or allopathic medicines.

4. **Nanakai** or pox is the fourth in importance due to its high mortality in lambs and kids. The mortality on flock basis however remains below 20%. The disease occurs throughout the year and causes abortion in all pregnant animals. There is no treatment for the disease in traditional or allopathic medicines.

5. **Tabba/Bukhar** or fever is the next in importance. The disease affects both sheep and goat, but commonly affects the young stock. The mortality is less than 20% but the morbidity is high and the disease is more prevalent in late autumn. There is no treatment for the disease in traditional or allopathic medicines.

6. **Warhai** is mainly limited to goat and may cause only 2% mortality, but the morbidity is very high. The disease mainly occurs during late winter and spring. There is no treatment for the disease in traditional or allopathic medicines.

7. **Pepri** affects both sheep and goat and mainly occurs during late spring. The mortality may be as high as 20%. There is no treatment for the disease in traditional or allopathic medicines.

8. **Budhai** is a pulmonary disease mainly affecting goat. The disease prevails throughout the year. Treatment for the disease exist in allopathic medicines, but all pregnant animals abort with the treatment.

9. **Pam or Kharish** (Mange or scabies) causes excessive skin and wool damage. The morbidity rates are exceptionally high. Treatment exists in both traditional and allopathic medicines, but the animal get re-infected from other infected animal. The disease therefore never ends. The disease is more common in goat than sheep and it is transmitted to human beings.

10. **Baghrhee** is more prevalent in goat as compared to sheep. The disease may occur throughout the year, but is more common in late autumn and winter. The mortality rate is less than 20%, however all the pregnant mothers abort after getting the infection. The disease is highly lethal for offspring. There is no treatment for the disease in traditional or allopathic medicines.

11. **Hamay** or anthrax is the disease of least importance for sheep and goat herders. It is equally prevalent in sheep and goat and is transmitted to human being to cause skin lesions. The disease is self-limiting but may cause up to 40% mortality. The disease is more prevalent
during late autumn, spring and dry summer months. There is no treatment for the disease in traditional or allopathic medicines.

The new diseases emerged since last year include disease that causes abscess on spleen and effect liver and the disease may cause 30% mortality. Another pulmonary disease affecting lungs has been given the name Tokhey due to consistent coughing. All the infected animals die. Apart from these, the important diseases of non-infectious nature include liver fluke, round worms, lungworms and warble flies. For different diseases, the herders traditionally use different medicinal plants. In case of high infectious disease, they grind the affected internal organs and place part of it on the punctured ears of the remaining health flock members. They also refer to religious people for saying Quranic verses to treat or avoid the disease apart from mostly self-medication of allopathic drugs.

**Changing land use, a threat to pastoral system**

The multiplying land fragmentation among the kin of previous landowners is compelling the distribution of communal lands. Such lands are mostly sold out to the tenants, who in turn invest family labor for their conversion to rain-fed cropping terraces. The most fertile irrigated land is rapidly being covered through concrete buildings for commercial and domestic purposes. The increasing dependence on remittance money and lower returns from labor input in local land resources has shifted the dependency from farming to off-farm sector. Land is viewed as salable asset to avert shocks or for investment in off-farm occupations. The remittance money primarily earned through the hillside residents is shifted through land transaction to landowners residents of down valley settlements, that is in turn utilized in erecting concrete buildings for renting out. Remittance and market economy based exploding population compounded by poverty is shrinking the per family land resource share. The increasing population is disturbing the man: land balance and competition in access to a productive land resource is increasing. The non-owner marginal groups are further marginalized and their access to land resources is gradually limiting. This cause increased rural urban migration, higher birth ratio to arrange more future remittance earning labor and increased dependence on external non-farm occupations. At present the valley serve as cheap labor-pockets for mega-cities industries down the country.

The increasing mistrust among landowners and non-owners due to land disputes after early seventies is motivating the landowner to make short term lease contract (annual) with the non-owner user to avert any threats to their possession. This on one side led to increasing polarization among owner/users and on the other side motivates the users to destructively utilize particularly the communally grazed land resources. Owners are not directly dependent on communal lands and these are considered salable assets, otherwise they are only interested in lease money. Hence, they possess the resource rather than owning it. Short tenure also compels non-owner users to utilize the resource on ad-hoc basis and intends to exploit the resource in his favor to the last possible extent. Reduced direct dependence and reduced returns from investing available labor and capital in land resources limit landowner capacity to sustainable conservation within the frame of agrarian economy.

The limited availability of grazing area on migratory routes compels early arrival to both upland and lowland grazing areas. The early arrival at upland has negative consequences for pastures and rangelands. The early arrival at upland pastures lead to the consumption of the seedling earlier than the appropriate grazing stage. This may gradually lead to shift from edible to non-edible plant population with consequent qualitative degradation of the pastures. The closure of lowland ranges has also resulted in overcrowding and overgrazing on the remaining rangeland with negative environmental consequences.
In the cooler upper region, the macro-environmental level seasonal complementarities in vegetable production with other zones, compels the locals to convert more and more marginal areas to cropping to earn. During initial phase the maize production, that complemented livestock production through more crop residues, was shifted to potato production. This was followed by decreasing dependence on livestock, limited availability of manure and increasing dependence on macro-mineral chemical fertilizers. The subsequent reduction in soil micro-minerals and organic matter status led to reduction in the potato size with limited capacity to compete in the market. To address the issue of diminishing returns, additional virgin marginal areas are cropped and the bigger size potatoes of such virgin areas are sold mixed with the denuded soil small size potatoes to get reasonable prices. The phenomenon has initiated the multiplying process of marginal land encroachment in the most fragile mountain ecosystem.

In order to facilitate the locals to get higher returns Kalam Integrated Development Project facilitated two potato crops in one year. Apart from higher stress on land resources, this compelled early arrival of transhumant landowner families and livestock to graze the recently sprouted forages and late departure, and have caused directional changes in the range and pastureland vegetation at both uplands and low lands toward less preferred forages. The transhumant sheep and goat herders previously used to spend 30-45 days during unilateral transaction between upland pastures and lowland ranges. The gradual closer of grazing areas along transaction routes and trekking routes, due to individualization of communal lands and their donor assisted afforestation, has facilitated the early arrival and late departure of non-owner transhumant and nomadic grazers from upland pastures. The overall impact though not yet properly quantified, seems to be qualitative and quantitative degradation of pastoral resources. The closure of many low land pastures for physical conservation has also resulted in overcrowding of non-owners herder’s livestock on the remaining range and scrublands.

The advents of off-season cash crops have largely modified the pastoral system in Kaghan valley. The dependence of cattle and buffalo herder Gujars generally occupying of most fertile pastoral niches on Qalang is gradually shifting their dependence from livestock toward cash crops on lease. The Potato Research Station Batakundi established with German assistance during 1981 has facilitated this shift. The pastoral area of Naran was selected for production of disease free potato, for seed during off-season for subsequent cultivation in the plain areas down the country during winter. Before the establishment of the station, only the tenants occupying the valley bottom for subsistence level staple production practiced subsistence level vegetable production. Till 1983, the local pastoral groups were motivated for cropping off-season vegetables. They were initially assisted in land preparation. During 1984, potato seed was freely distributed among the pastoral occupants. During 1986 the station succeeded in producing 60,000 bags (90-kg/bag) potato, by cropping about 7000 Kanal of pastoral area. This led to earning of about seven million rupees during 1986. During the same year, common beans and cauliflower were also introduced through establishment of demonstration plots.

During the period between 1986-88 the station worked to provide the pastoral vegetable producers the transaction costs of the produce to the market, while the seed was provided free of cost. After 1988, the Station started selling of seed to the pastoral groups at the rate of Rs 2/- per kg. Presently it is sold at the rate of Rs 100/- per kg. The commercial production of cauliflower could not sustain due to high transportation costs. The production of common beans has however extensively extended. The reason is its minimum watering requirement, ability to grow on sloping land and limited labor requirements. During 2001, the station provided inputs for 5000 Kanal of potato and 9000 Kanal of common beans. During 2001, the total vegetable production was worth 40 million rupees. The cropping is further extending and the area under cash crop is supposed to
extend rapidly. Potatoes are sown at Barhwa i, Banas, Danga, Daboug, Maidan Batakundi, Agli Batakundi, Sahouche and Naran. Common Beans are sown in Dadar, Lalazar, Daboug, Dounga, Banas, Sheilibela, Barhwai, Serian, Jalkadh, Pattobela, Rewrhi, Jourhian, Kalak, Chenja, Wejtaar, Tookraan and Daddar pastoral areas.

**Conclusions**

The broad categories of mobile pastoral systems include long distance non-owner goat, goat and sheep, and sheep flocks travelling from the plains of Peshawar valley and Potohar plateau proceeding through the sub humid forest zone to upland pastures extending from Chitral to Neelum valley in Azad Jammu and Kashmir. The short distance landowner transhumance is prevailing in each region, however the increasing market access is gradually shifting dependence from livestock to cash crops, off-farm occupations and remittance earning down the country. In majority of situation, the intermediate distance transhumant (non-owner cattle herders have in majority of situation shifted to off season cash crops or peri-urban commercial dairy producers.

The upland summer grazing areas situated above tree line extends from Tirich pastures in Chitral, Swat and Dir Kohistan on western side of the Indus and Supat, Chorh and Naran pastures on the eastern side of the Indus. The ownership of almost all the pastoral areas is perceived to be communal and claimed by the adjacent resident population. Absent non-dependent landlords are more common for the pastures on the eastern side River Indus. The access rights for non-owner pastoral groups differ from pasture to pasture and affect the pastoral occupation pattern. The leasing pattern in some areas is entirely cash based, while in other it may be entirely kind based (live animals and livestock products) or mixed kind and cash. The relations between landowners and users also differ from region to region. For example in Goleen (Chitral), owners and users have lingering on disputes over access to pasture, while in Chorh both landowners and users have more cordial relations due to political reasons. In general, the exploding population is increasing man: land ratio and disputes over access rights and leading to gradual increase in political polarization among landowners and non-owner users. Disputes on land ownership and resource use in some areas are leading to destructive resource utilization.

The pastoral groups in general reduce their herd/flock size during winter to pass through the winter scarcity and extend the herd/flock during late spring. The herd size of non-owner sheep/goat pastoral herders is larger and may include 150-500 animals. Many poor small flock owners with less than 70 animals each may join during upward and downward movement. The flock/ herd size of landowner short-distance pastoral groups may include 15-100 animals. Before 1970s landowner herd size was comparable to those of the non-owners, however with improved communications and improved links with market the dependence of landowner pastoraals on livestock has reduced. This is particularly true in easily accessible areas like Swat and Kaghan valley.

The traditional social and political institutions of both landowner and non-owners pastoral groups are strong due to the tribal political background. In tribal system the centralized political institutions are lacking, hence local level socio-political institutions are exceptionally strong. With the gradual infusion of modern centralized political order, the role local socio-political institutions are reducing at a higher pace among landowner pastoral groups than non-owner pastoral. The non-owner pastoral groups still possess strong communal welfare mechanism. They share with a component family if it suffers accidental loss of herd and their sorrowful occasions are more heavily participated.
The females particularly of non-owner pastoral families share equal workload. She do all the in-house activities in addition to fuel wood collection, water collection, pasturing of livestock, and livestock product processing. Among pheasant families she also does weed thinning, forage harvesting and grain processing after crop harvest. Both land and livestock assets are however mostly transferred between male members. The non-owner pastoral groups have limited wealth differences as compared to landowner pastoral groups. Their utilization levels are minimal; hence, they never intend to run for accumulating excessive wealth. The largest flock of non-owner herder rarely exceeds five hundred animals. Also, larger herds require higher labor inputs and heavy losses in case of epidemics or denied access to a lowland or upland pastoral area.

The institutions for providing social and economic services have a generalized course of action mainly for sedentary population. The mobile groups can only partially obtain benefits from such institutions. If the pastoralists intend to provide schooling to their children, they would need to retain part of family at lower elevation and will disturb their entire livelihood pattern. Health facilities can be availed during their stay at lower elevation. The courts only accept bail of a person owning a landed property; hence, non-owner pastoral is obliged to screw down to obtain support of landowners during their internal conflicts. They can not benefit from police security during their upward and downward movement. The veterinary services mainly focus on sedentary formers in bigger settlements and they have no regular and efficient mobile service providing system. The forest department carryout afforestation on communal lands mainly used by non-owner pastoralists, thus denying their access to the resource on which pastoral depends. The forestry reforms process vision is to declare all the communal land used by mobile non-owner pastoraals as forest-able lands in an effort to conserve the physical environment with the consent of landowners ignoring the cost to be borne by non-owner pastoral users.

Forced marginalization by reducing non-owner user access to land resource is inducing poverty & leading to political polarization among landowners and non-owner users. This is causing social degradation at the cost of ad-hoc apparent physical rehabilitation of natural resource base. Directing the benefits of resource conservation to non-dependent landowners and placing the cost on non-owner users incline users to destructive resource utility, hence the implications of market failure become equally applicable to conservation process under existing land tenure system. The institutions and individuals involved in resource conservation are dealing with absent landlords of communal lands and ignore the mostly non-owner actual resource users in conservation. Consequently, non-owner users ignore their conservation planning. The landlord’s involvement in based on their control over the resource. The possessive nature due to their non-dependency keeps non-dependent landowner involvement feasible till the project life mainly to accrue secondary benefits. In many situations his priorities differs from the priorities of conservation and land use planners. On the other hand, non-owner users can not be involved in conservation due to ad-hoc tenure system. For landowners, political implications of facilitated conservation efforts are some time of overriding importance as it facilitates them to reduce users access rights to the resource.

The relation of the pastoral groups with the market is primarily through middleman. The capacity of livestock to travel by their own to the market place make livestock production economically feasible enterprise in hardly accessible areas. The non-owner groups are more advantageous than the short-distance owner pastoral groups as they have higher market access during their long distance transhumance. Autumn remain the main abundance period of marketable livestock. The pastoral areas of mountains in general serve as primary supply region for mutton, to the cities in plains of Punjab. The livestock products sold to the market mainly include wool, hairs and some milk products, while live animals, milk products and manure are some time provided to the landowners under tenure arrangements. The meat, mutton, milk and milk products market is
regulated to provide relief to urban population at the cost of pastoral producers. This market bias is serving as a compelling factor for de-investment in livestock enterprise.

In the cooler upper region, the macro-environmental level seasonal complementarities in vegetable production with other zones, compels the locals to convert more and more marginal areas to cropping to earn. During initial phase the maize production, that complemented livestock production through more crop residues, was shifted to potato production. This was followed by decreasing dependence on livestock, limited availability of manure and increasing dependence on macro-mineral chemical fertilizers. The subsequent reduction in soil micro-minerals and organic matter status led to reduction in the potato size with limited capacity to compete in the market. The address the issue of diminishing returns, additional virgin marginal areas are cropped and the bigger size potatoes of such virgin areas are sold mixed with the denuded soil small size potatoes to get reasonable prices. The phenomenon has initiated the multiplying process of marginal land encroachment in the most fragile mountain ecosystem.

The common man strategically utilize his surrounding resources in trans-disciplinarity, fixing his priorities according to labor input: resource output calculations, while the service delivery institutions approach is sectoral in nature, hence lacking common interacting grounds with relevant stakeholders. Sectoral approach consistently under score external implications. For example, potato extension to Gabral valley (Swat Kohistan) for poverty reduction ignored ecological implications. The previously self sufficient pastoral people of the valley are now bringing manure for their fields and maize stalks for their livestock from down valley. Their consumption levels have been increased and they are now increasingly indebted. The meat demands of their increasing consumption levels, cash crop are now extending to fragile, sloping marginal areas not suitable for cropping with consequent resource degradation.

The current trends in recyclable natural resources are that natural forest is decreasing, and cropping is extending to steeper slopes. The seasonality in production, complemented by urban biased pricing structure is reducing the dependence on rural natural resources with low labor inputs for local land output and its resulting mismanagement. The potential family labor capable to effectively manage local land is diverted from cropping to remittances. The remittance money is invested in purchase of marginal lands and residential construction with little investment in developmental activities, while for construction, the productive lands are generally utilized due to little pay-off of cropping sector. Imposing price ceiling on grains and livestock products, have decreased their pay off, hence considered second grade economic activities. Outdated counter seasonal strategies and increasing externalities is fueling the crises of poverty. The urban biases in pricing policies and aggregation of social services in urban areas are fueling rural urban migration.

Policy Recommendations